MAY, 1942

ELECTRICAL SOUTH

LIBRARY ... FLORIDA

FANS by HUNTER-CENTURY

55th SEASON

52-In Hotel Type

24-In "Airspread" Ceiling

HUNTER, who has made fans and ventilators exclusively during 55 years, is now operating under War Production Board restrictions. • No more fans will be made after May 31 except for the Army, Navy and Maritime Commission. And after August 1 no more fans will be made during the war. • HUNTER unfilled orders now on hand include over 80 percent direct contracts with government agencies and the balance are mostly scheduled for defense projects. • For the present, HUNTER is accepting orders from regular customers for the small remaining inventory of smaller size attic fans and 36 inch and 52 inch ceiling fans.

HUNTER FAN & VENTILATING COMPANY, INC.

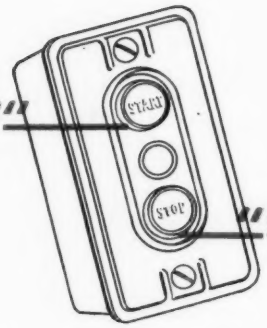
Factory: FULTON, N. Y.

General Sales Offices: Memphis, Sterick Bldg. *Eastern Sales Office*: New York, 92 Warren Street *Western Sales Office*: St. Louis, 1804 Pine Street

Sales Offices:
ATLANTA
CHICAGO
DALLAS
HOUSTON
LOS ANGELES
PHILADELPHIA

Zephair Comfort Cooling Attic and Commercial Ventilators

Sales Offices:
BOSTON
CLEVELAND
DETROIT
KANSAS CITY
NEW ORLEANS
PITTSBURGH
ST. LOUIS



"START"

"STOP"

but no "maybe"

WITH WESTINGHOUSE "De-ion" LINESTARTERS

SIZE 1 CLASS 11-200 Linestarter

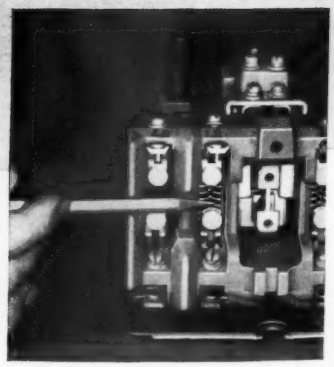
There's no "maybe" about the operation of the Westinghouse "De-ion" Linestarter. Simple, direct, vertical operation with just ONE moving part insures that the motor it controls will definitely "start" or "stop" without question or hesitation. Freedom from bearings and complicated linkages insures positive action. Vertical operation, as well, prevents the possibility of shocks causing accidental closing of the starter.

This basic feature, together with exclusive "De-ion" arc quenching protection for contacts, explains why Westinghouse Linestarters offer better protection against production interruptions on important circuits. Accurate, unvarying Bi-metal overload protection means further assurance for vital drives. Get these advantages today—check your nearest Westinghouse Agent.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

J-21185-A

VERTICAL OPERATION . . . JUST ONE MOVING PART . . . The armature and contact crossbar are a single unit that moves vertically.



"DE-ION" ARC QUENCHER PROLONGS CONTACT LIFE . . . When contacts open, arc is drawn into "De-ion" grids and instantly extinguished.

Westinghouse

Erase these Questions FAST When Planning a Job

Call on this Helpful Service of the HAZARD ENGINEERING DEPARTMENT

Here's a helpful hand offered by Hazard to make it easier for you to plan wiring jobs these days. Our experienced engineers are kept informed with complete, last minute news on the what, where and when of the supply of wires. Add this to the training and experience of Hazard Engineers and you can readily see how these men will help you solve many problems today.

Let's take as an example a new wiring job. Usually there are several alternative methods for installing an electrical service. Hazard Engineers are in position to tell you immediately which method would be wisest from the standpoint of availability of wires and where you can get them quickest. With the wiring picture changing so rapidly, this information saves you time, expense and can help you get more wiring jobs.

This Hazard service is complete . . . reliable . . . and yours without obligation. As always the first purpose of the Hazard Engineering Department is to help you, and there was never a better time to make use of it than right now.

HAZARD INSULATED WIRE WORKS
DIVISION OF THE OKONITE COMPANY
Works: Wilkes-Barre, Pennsylvania
Offices in Principal Cities

HAZARD
INSULATED WIRES & CABLES

ELECTRICAL SOUTH is published monthly by W. R. C. Smith Publishing Co., Marietta, Ga., and Atlanta, Ga., U. S. A.
Subscription rates, United States and Possessions, $1.00 for one year; $2.00 for three years; Canada, $1.50 per year; Foreign Countries, $2.00 per year.
Entered as second class matter at the postoffice, Marietta, Ga., under Act of March 3, 1879.
Volume 22 Number 5

You profit from *our* experience

Never satisfied with making just *good* products, the Frank Adam Electric Company, for over fifty years, has been producing electrical equipment *built better than necessary* . . . Now, with long-experienced personnel, and with precision machines of the most modern design, we are equipped to meet all requirements of defense — including accuracy and high quality — and to meet them with dispatch . . . The many industries — great and small — using FA Electrical Products have found them efficient, reliable and economical — good for a long life of satisfactory service. It is certain that they will serve you as well — that *you* will profit from *our* experience.

— *These Informative Bulletins Will Help You* —

in the preparation of plans and specifications for your electrical distribution system, whether for new construction or modernization. Complete information is given regarding each type of equipment. Write today for the ones in which you are interested:

☐ No. 57

FA Dublbrak Circuit Breaker Panelboards and Cabinets.

16 pp. Illustrations, dimensions, capacities, prices, and suggested specifications.

☐ No. 65

FA Busduct Feeder & Plugin Types.

20 pp. Modern electrical distribution system described and illustrated. Complete with details and specifications.

☐ No. 59

FA Shutlbrak Enclosed Switches, interlocking and non-interlocking.

16 pp. complete descriptions, dimensions, capacities, prices and specifications. Also describes Shutlbrak Switch Switchboards.

☐ No. 62

FA AC Circuit Breaker Service Equipment, Load Centers and Panelboards.

20 pp. Includes capacities, dimensions, prices, wiring diagrams, illustrations and suggested specifications.

Illustrated Bulletins on other FA Products are in preparation.

If you wish several of the above, a sturdy binder will be included. Check the ones you want, sign your name and address on the margin, and mail this page to Frank Adam Electric Company, St. Louis, Mo.

EST. 1891 — THE SIGN OF A BETTER JOB

Frank Adam

ELECTRICAL PRODUCTS

for Defense Industry

FRANK ADAM ELECTRIC CO.
ST. LOUIS, MO. U.S.A.

NEW ENGINEERING DATA BOOK FREE!

- CONDUIT
- INDUSTRIAL BUSWAYS
- SURFACE RACEWAYS
- "PLUG-IN" STRIP
- ARMORED CABLE
- FLEXIBLE TUBING
- GORILLA GRIPS
- BRACKETS WIREHOLDERS
- FUSES
- WIRE & CABLE
- DATA
- INDEX

360 PAGES OF VITAL ENGINEERING DATA ON NATIONAL ELECTRIC QUALITY PRODUCTS

This new Data Book or catalog covers every roughing-in wiring system in use today. Each section contains the complete listing of one system and all the fittings for that system. Eliminate guess work by using a National Electric Data Book in your office.

It's yours for the writing

NATIONAL ELECTRIC PRODUCTS CORPORATION, 360 Fulton Building, Pittsburgh, Pa.
Gentlemen: I would like to receive without obligation a copy of your new National Electric Engineering Data Book.

NAME _____ TITLE _____ COMPANY _____ STREET ADDRESS _____ CITY _____ STATE _____

National Electric Products Corporation

FULTON BUILDING, PITTSBURGH, PENNA.

Goal Ahead

Like every thinking American, we are all out for Victory—Victory at the earliest possible moment.

Most of the 41 years of Youngstown's history have been years of peace. Like you, we look forward confidently to that day when steel can turn from its terrible work of destruction to the constructive task of restoring the foundations and rebuilding the structure of our national health and prosperity and happiness.

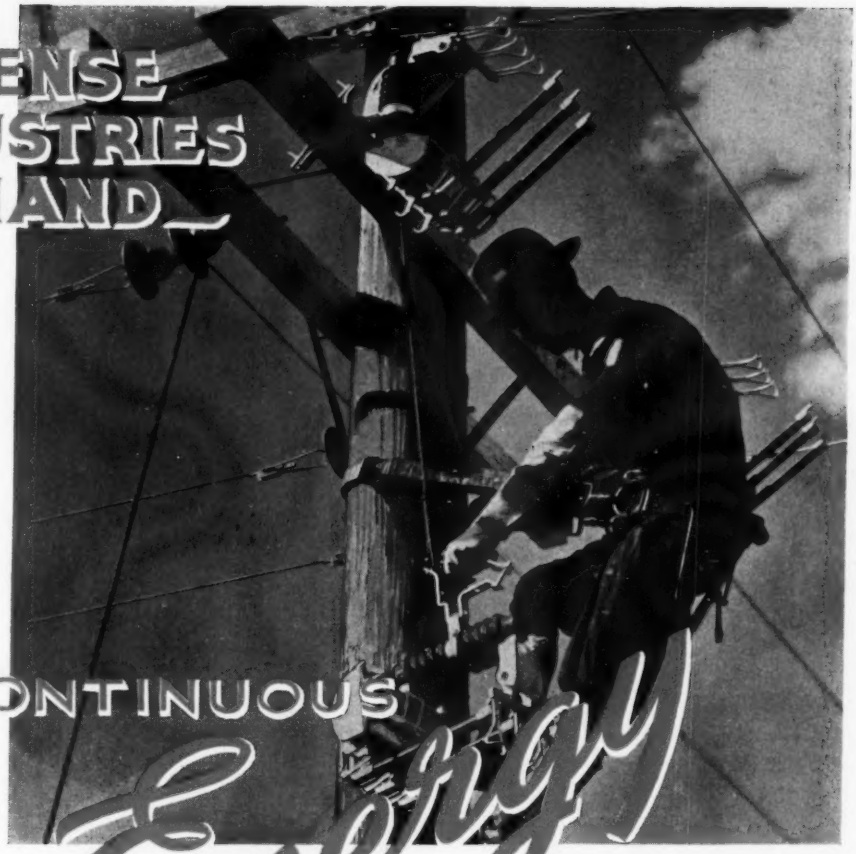
Victory when it comes must be unqualified, and complete. Victory calls for hard work—unstinted, total effort. So let us devote every machine and every ounce of manpower to the winning of the war. That is American Industry's task for TODAY——not tomorrow, but NOW.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN, OHIO

25-31E

DEFENSE INDUSTRIES DEMAND—

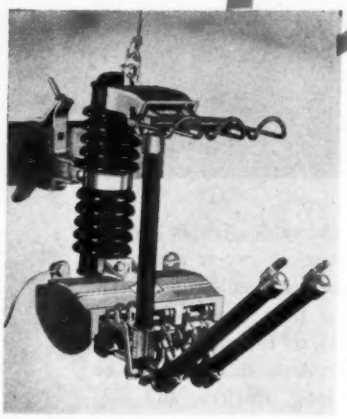


CONTINUOUS

Energy

with KEARNEY

TRIP-SAVERS



At an important location—a customer—a Defense Industry—that can't afford shutdowns caused by temporary faults—operating men will recommend the installation of Kearney Repeating Trip-Saver Switches fused with Kearney Fuse Links.

IT'S "eyes-up," "all-out"—and up the pole for some lineman, maybe yours, to refuse a cartridge—to further assure uninterrupted service at some important location—perhaps at a mine or mill or at some modern airplane plant busily engaged in National Defense Production.

Give them full credit—these Line Crews of America. It's a mighty big and important job today to keep power flowing steadily into plants where the big wheels of machinery are grinding out products which assure protection of American Democracy which our forefathers fought to give us.

JAMES R. KEARNEY CORPORATION
4224-42 CLAYTON AVE. - - - ST. LOUIS, MISSOURI
Canadian Plant • Toronto, Canada

KEEP THEM WORKING *with*

KEARNEY PRODUCTS

Tops personally, he and his staff are the nemesis of all incoming materials that do not measure up to Anaconda quality standards: they check them all.

In these critical days, no one can afford to make mistakes, no matter how trifling, in so vital a product as electrical wires and cables.

Relentless guard over the quality of products going into the manufacture of Anaconda wires and cables, is this "bogey man." He and his group of expert associates check every item against Anaconda's rigid specifications (tougher by far than those stipulated by government agencies), to the end that every wire and cable bearing the Anaconda name can be trusted for long, efficient, and economical service. 42244

ANACONDA
from mine to consumer

This familiar trade-mark symbolizes the best efforts of modern research and production.

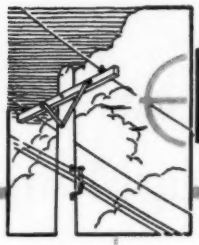
GENERAL OFFICES: 25 Broadway, New York
CHICAGO OFFICE: 20 North Wacker Drive
Subsidiary of Anaconda Copper Mining Co.
Sales Offices in Principal Cities

ELECTRICAL WIRES AND CABLES OF COPPER ARE THE LIFE LINES OF OUR NATION

ANACONDA WIRE & CABLE COMPANY

MAY, 1942

Volume 22 No. 5



ELECTRICAL SOUTH

J. C. MARTIN,
Manager

RICHARD P. SMITH,
Promotion Manager

W. E. COOGLER,
Production Manager

Editorial and Business Offices

GRANT BUILDING
ATLANTA, GEORGIA

Member of A. B. P.
Member of A. B. C.

ANNUAL SUBSCRIPTION—$1.00
THREE YEARS—$2.00
CANADA—$1.50; FOREIGN—$2.00

Business Representatives:
L. E. ALLEN, 189 West Madison St., Chicago, Ill. Tel.: Lakeview 10282.
L. R. MCCARTY, 325 Winding Way, Merion, Pa. Tel.: Merion 1066.
W. A. MCGEE, P. O. Box 562, Charlotte, N. C. Tel.: 3-4932.

Published Monthly by

W. R. C. SMITH
PUBLISHING CO.

Marietta and Atlanta, Ga.

W. J. ROOKE, *President*,
T. W. MCALLISTER, *Vice-President and Editorial Director*,
E. W. O'BRIEN, *Vice-President*,
R. W. PHILIP, *Vice-President*,
RICHARD P. SMITH, *Vice-President*,
O. A. SHARPLESS, *Treasurer*,
J. C. MARTIN, *Secretary*,
E. L. PHILPOT, *Asst. Secretary and Treasurer*.

Publishers Also of
COTTON
SOUTHERN HARDWARE
SOUTHERN AUTOMOTIVE JOURNAL
SOUTHERN POWER AND INDUSTRY

T. W. McALLISTER, Editorial Director CARL W. EVANS, Editor

NAT M. JOHNSON, Southwestern Editor

Contents

Power for War Production Harold F. Smiddy, Ebasco Services, Incorporated	9
Power Pooling in the National Emergency Walter R. McDonald, Georgia Public Service Commission	16
Speed Urged in War Materials Production W. H. Wheeler, Jr., Contracts Distribution Branch, WPB	17
Industrial and Utility Operations in War Time Davis M. DeBard, Stone and Webster Service Corporation	18
Winning Peace More Important than Ever! Stuart M. Crocker, General Electric Company	21
Maintaining Good Will During the Emergency Charles A. Collier, Georgia Power Company	23
Keeping Dealers in Business with Appliance Repairs	12
Service Training Program to Meet Dealers' Needs	14
Electric Club Serves Members in Troubled Times	15
Oklahoma Utility Executives Hold Annual Conference	24
War-Time Problems Feature Utility Engineer Meetings	26
Industrial Wiring Practice—Part 5	29
Business Security through Better Management—Part 5	31

Departments

Practical Helps for the Trade	35
Industrial Electrification	40
News of the Industry	44
Personal Notes about Men You Know	50
New Equipment and Materials	52

Copyrighted 1942, W. R. C. Smith Publishing Co., Atlanta, Ga.

Entered as second class matter at Marietta, Ga., U. S. A., under Act of March 3, 1879

★

"We've taken on a bigger job now than supplying lamps"

A statement about the lighting situation of interest to every utility executive

As more and more plants in America start running multiple shifts seven days a week, the question of lighting for production becomes more and more serious. Unfortunately most industrial lighting simply is not geared for high-speed production. The average, as a matter of fact, is much less than is needed for the job that must be done. And this is especially true in thousands of smaller plants which have been converted to war work. Because the converted plant can be the bottleneck which holds up the completed production of war materials somewhere else.

We realize, as you do, that because of shortages on critical materials . . . because of the shortness of time . . . there is no possibility of relighting the twenty-five or thirty thousand plants in this important group.

But we believe that if we in the electrical industry will tackle the job, we can measurably improve the lighting, and through that, the production in these countless smaller factories. Here are the sort of things that need not involve any quantity of critical materials, yet can make a significant difference in the lighting of almost any plant:

1. Soap and water — on a *regular* cleaning schedule.
2. Right size bulbs in present fixtures.
3. Reallocation of present lighting to fit new demands.
4. Supplementary lighting—for the most critical seeing operations, such as inspections.
5. Light colored walls to reduce light absorption; light colored finishes on machinery to increase visibility.
6. New incandescent or fluorescent installations, *only if these other methods are inadequate.*
7. Frequent light meter checks on maintenance.

Isn't this a program in which we can all unite . . . utilities, manufacturers, jobbers? Is there any better way for us to turn our man-power into bombers and tanks and ships than to open up some of the bottlenecks that are holding back our war effort?

We realize, as you do, that time is tragically short.

G-E MAZDA LAMPS

GENERAL ELECTRIC

Power for War Production

The personal and productive capacity needed to meet the utility's war-time responsibility.

By Harold F. Smiddy*

WINNING a war is a job for serious, aroused fighting men. If you want to win a war you had better get mad—not angry, mad! This war is not a boxing contest to exhibit a particular skill. It is a plain, old-fashioned fight with enemies who believe that anything goes and no holds are barred. Only total concentration on that fight will prevent receiving kicks which will cause collapse; only total concentration will make it possible to batter the enemy to submission. The job is one for men. It is ability, training, hard work, and personal capacity which will bring victory, in whatever field of endeavor the individual may be doing his part for the common cause.

Now this brings us to the point of thinking a little bit about how personal capacity in the utility business may be translated into so developing and operating the necessary productive capacity that the utility's responsibility to deliver power for war production may be continuously and adequately fulfilled. The man comes first. But in this war his job is to use the machine to the best possible advantage. So productive capacity is necessary too.

Here again the job is personal. No one is going to do it for you. It isn't a government responsibility; it is yours. Certainly you have many perplexities, but your task is to think your own way out of them. And as one able writer said a while ago: "Thinking your way out of perplexities involves taking the initiative."

In particular, it is up to you now to work out ways to coordinate power supply facilities on a regional scope, not merely within the service areas of your individual companies. War power needs are on a scale that necessitates physical operation of all electric lines and stations in many regions on as fully coordinated a basis as if they were all under one ownership. Every technique for doing so has already been developed and applied by men like yourselves within the territories of your own systems. That isn't enough today. Inter-system coordination is indispensable. It is your job, as "know-how" men, to provide it.

If you don't, government administrators will run over you and you may have a hard time ever to get rid of them! If you do, you will accomplish two marvelous objectives. First, you will serve your country well in its hour of crisis. Second, you will establish by performance that the physical problems of serving the ever-growing electric requirements in this nation can best continue to be handled in the future by the resourcefulness and initiative of your companies; and that despite cramping and atomizing restrictions upon wider common ownership of electric facilities on a geographic regional basis, it is not necessary to resort to public ownership to get the job done.

The responsibility is plainly upon you to take a positive approach to such problems; and to all of your other problems. This applies alike to the work of thinking out or proposing the best possible solutions, and to the job of making your resultant plans work so as to provide the necessary electric power for war production.

In other words it is not enough for you merely to have plans, or even for you to propose them. You have to make them work if you are to fulfill your war-time responsibility. This point of view was beautifully set forth in a resolution adopted recently by another group of men interested in utility problems in war-time. Reference is made to the National Association of Railroads and Utilities Commissioners and to the resolution under which they set up a Special War Committee some weeks ago to deal with their problems during the emergency.

It is significant that the resolution initiating that Committee not only charged it with the duty of conferring with appropriate federal and state authorities, but also with the obligation of giving advice and suggestions as to what (the state) commissions can do affirmatively to help the nation in the present emergency, and of selecting agencies to carry out its powers and to make effective the offers of cooperation heretofore made in the name of the association.

In other words they made plain their purpose not only to offer positive ideas of their own, but to follow through to make them work.

That is your responsibility as to your problems. When every individual and every group in this country realizes that the task is to "discover how and do it yourself," rather than to wait for a canned scheme from Washington for solving every little production problem that comes up, the war effort will be well on the way to victory.

It is by such means that you can apply your personal capacity in the utility industry to see that its productive capacity continues to turn out power for war production. And it is appropriate now, before winding up this discussion of the utility's responsibility in war-time, to review how you and

*Mr. Smiddy is head of Operating Section, Ebasco Services, Incorporated, New York City, N. Y. This article is adapted from an address presented before the Southeastern Electric Exchange, at its annual conference on April 16, Edgewater Park, Miss.

others operating this country's electric systems have actually carried out that task to date.

The electric power industry is one of the largest and most important in the United States. Its production is absolutely necessary so that all other basic war production industries—old or new—can operate.

So far the power industry has met all demands for war power. It must continue to do so. So far it has, unlike almost every other big production industry, also been able to meet practically all other demands of its normal customers. Whether it can continue to do so depends on first, the growth of war needs and, second, the trend of use by other customers, whose requirements for electricity, as for everything else today, must be secondary to the war needs.

As more and more industries, commercial establishments and families have their normal operations and activities upset, the general tendency is for them to use less electric power than usual. The power capacity so being made idle in increasing amounts, plus new capacity still being installed, has, up to now, kept total capacity above total war needs to date.

Hence there has not yet been an actual national war power shortage; although actual shortages of many other raw materials and products have definitely taken place. In the latter case, by priority and allocation and rationing procedures, war uses have been put first and others given what is left. When, and if, there is any actual power shortage—nationally or locally—this is just what will be done as to electric power.

The problem will not be harder than that of rationing or allocating sugar, steel, copper, rubber or autos. It will be easier. This is because no one can hoard or stock electricity. No one can get delivery of more power than is currently used, because it can't be so secured or stored.

Consequently, the only job will be to use all electric generating machinery, and electric lines, to serve actual needs from hour to hour; shutting off by both voluntary and—if needed—by mandatory procedure any non-essential uses in home, office, store or factory during any hours when there may not be enough to go completely around.

There is no case yet where actual war power loads have been shut down because of lack of electricity; nor, even yet, of non-war loads except only for a few temporary emergencies in a few limited areas. Many civilian loads can be cut off if necessary, as already noted. By such procedure, it is certain that there is no shortage in sight to carry the remaining actual war loads. The latter are very large and are getting bigger all the time. But they alone, or even when topped by indispensable non-war or civilian electricity requirements, have been and will be served.

To do so, many unusual and ingenious operating procedures, on top of standard or normal methods, may be required. For instance, usually, the power companies keep many units idle in reserve over peak hours in case of breakdowns of operating units. Such reserves can now be run at such times if their output will keep customers going. And if failures of some units or lines occur, non-essential uses can be dropped until repairs are made. It is like having the National Guard on hand in reserve in peace times, but on duty and operating in wartime. Its occasional local guard duties are simply abandoned for the time being or taken care of by other and emergency procedures when it is away at war.

In the same way, in war-time many older machines and interconnections, which are on hand but not ordinarily operated continuously, can be run. They may cost a little more to run or be a little less efficient than newer equipment but they do the job all right in the pinch. It's like calling on the Veterans to help out by doing Home Guard work or extra police work when the National Guard and the police force are swamped with more direct or urgent war duties.

The great war-time problem, therefore, is to see that whatever plants and lines and equipment and manpower the power systems have, or can bring into operation, are all used and are well coordinated, so as to do the best job of meeting overall electric loads and of giving all necessary preference to war power needs first.

The task becomes one simply of skillful, alert management, so far as the basic essential of getting the physical work done, which is the first consideration, is concerned. Matters of cost, efficiency, convenience, and similar factors come second.

The actual record to date shows that the managements of the electric systems have filled the bill well. They have applied their personal capacity and their productive capacity with initiative and resourcefulness. Their systems were so planned and built that they have been able to meet heavy new loads for war production so far. They have been, and still are, building new plants and lines to meet new needs, just as fast as such new loads for their service areas are made known to them and materials made available. The electric supply is ready before the new industrial facilities are finished and ready to use it.

In spite of such controlling facts as to the situation to date, there is much public talk and writing about whether the expanded production program for war industries, which is now growing so fast, may bog down the power systems, so that they may be the weak link in the production chain to hold that big program in full swing. If such danger is real, it is very serious; and must be most carefully studied and effectively prevented.

But since no war industry has, in fact, yet been critically short of power, the public's natural opinion should be that a mighty good job has been done and that those

"There is no problem of conversion or subcontracting or similar upsetting by-products of war in our industry. The same kilowatt hours and horsepower from the same machines and lines are used to run a factory whether it makes autos, airplanes, tanks, toothpaste, or sardine cans. There are able, experienced men on the spot who know how to run such electrical plants and lines. It is their Utility Responsibility in wartime to do just that. They have the Personal Capacity required. They know how to develop and operate the Productive Capacity which is needed. Put them at it and start worrying about something else. They will handle the power supply problem if it can be put in their realm of production and pulled out of the province of politics."—Harold F. Smiddy.

responsible ought to be capable of handling whatever new war problems arise, as to electric power, in fine shape. The results speak for themselves. They cry out for all to hear that the managers of this nation's electric systems know their job, are doing it, and so should be allowed to continue doing it to produce power for maximum war production. Regardless of all other considerations, this is no time to break up such functioning management, technical and operating staffs.

As a matter of fact, not only should operating and production people who are doing their job well in the utility business, or any other, be relieved of the fear of being ousted through so-called government reform moves, but also they should be freed of countless calls on their time which currently divert far too many hours from local productive activities to unwinding governmental red tape.

As a word of warning, you don't have to spend more than ten minutes wandering through the maze of government offices in Washington, where the desks stretch out in endless rows, to begin to fear further growth of the Brobdingnagion monster, which visually there seems to be swamping the giant Gulliver of American industrial production with thousands of Lillputian threads of paper. If the Lilliputians in this emergency want their Gulliver in the form of American business to defend them and fight their battles, they had better cut away quickly much of the red tape with which so far they have been binding him with increasing tightness.

Too much attempt has been made to concentrate into Washington the most minute analyses and even supervision of many day to day war-time problems of American industry, including those of the electric utility companies.

Too many agencies there are staffed heavily with men of far less experience than the operating managements of most of those companies, all trying to work largely from boiled down questionnaire statistics rather than from long-time local personal knowledge of facilities and difficulties; and with decidedly less than completely fruitful results.

Too often today overworked operating company engineers and executives are forced to waste valuable days explaining what they are doing, in most minute detail, to eager but inexperienced government personnel. Such time can —and should—be employed more usefully in expanding war power production; rather than in merely pow-wowing about it, and in pointing out the practical short-comings of many novel ideas, which suddenly seem important to bureaucratic officials discovering for the first time, and with great amazement, many of the most elementary operating techniques of a great industry, which are old stuff to even its secondary supervisory forces.

Even granting the best of motives, no few power operators could earnestly and patriotically suggest that more speed and less friction would inevitably ensue if Washington representatives were to concentrate on outlining the Government's needs; and then letting those who know how to concentrate on meeting those needs in each local or regional service area by best use of the skilled men and facilities there available.

The fundamental cure for eliminating the present confusion, duplication and red tape is simple in war-time. Good intentions are no excuse. The removal treatment meted out so rapidly to Pearl Harbor military leaders, as well as to earlier production leaders in the administration of the national procurement and production effort, will certainly strike most Americans as the first medicine to be applied.

Niceties of diagnoses can be postponed until the war is over. Government officials who are unable, or unwilling to achieve harmony, coordination and general acceptance of their functions now ought to be put out to pasture and kept there off the track while the production train rolls by to

(Continued on page 56)

The Power Situation—

(1) No war load has yet been shut down for lack of electric power.

(2) None needs to be.

(3) The power issue, like the labor issue, the farm issue, and every other such issue, ought to be taken out of politics for the duration.

(4) Government agencies with a legitimate war-time place in the power production picture should be cleared to perform; freed of pressure except to produce. Other government agencies should get out of the power supply problem for the duration, both avoiding duplication and delay on the one hand and foregoing selfish and misdirected ambitions, theories and objectives on the other.

(5) War-time regulatory and enforcement activities, like operations, should be de-centralized; and maximum use should be made of the local regulatory commissions and their staffs who can best handle such functions locally, in war as in peace.

(6) The job of outlining general war power requirements should be centralized and streamlined as to basic scope and objectives.

(7) The work of meeting such requirements, fully and on time, should be localized to the areas where, alone, they can be met in fact; that is in the service territories of the operating electric systems all over the United States, private and public alike.

(8) Managements, technical experts, and other personnel of such systems should be given the "go" sign to do the coordinated construction, maintenance and operating task of getting all needed electric power for war production to the loads, wherever it is needed, whenever it is needed.

(9) Those individuals in any capacity, in government or in industry, who can't ditch their peace-time ideas, or who can't swing their war-time jobs under such a program, should be put at something they can do. It is not necessary now to change all the hard-learned lessons of experience nor to upset well-knit and sound companies, or basic government agencies either. Just throw out those individuals who can't hold up their end.

(10) Concentrate on production and let secondary considerations come second. There is enough power available or in sight to do the vital war production job and to meet necessary civilian requirements. There are good operating systems, already in place in the overwhelming preponderance of cases, to turn out such vital power.—**(Harold F. Smiddy, Ebasco Services, Inc.)**

Keeping Dealers in Business With Appliance Repairs

IN CONNECTION with the all-important question as to whether electrical appliance dealers should "stay in the appliance business" or resort to substitute merchandise which will take them largely out of the business, New Orleans Public Service, Inc., New Orleans, is providing a practical answer with its Certified Electric Appliance Repair Shops plan—taking the initiative by actually going out into the field and supplying dealers with service work.

Under this plan, the utility company has enrolled a group of appliance dealers, electrical dealers, electrical contractors, hardware stores and radio shops to form a list of thoroughly-qualified shops which New Orleans Public Service guarantees to the public as able to put any appliance back into A-1 condition. According to utility executives, origination of the plan cannot be credited to any one individual. It was the result of "group thinking" or constructive planning against war curtailment difficulties, emerging in September, 1941, as a very workable argument against "closing up" or switching to other lines.

"The greatest advantage has been the general emphasis on conservation in every aspect of life," it was pointed out, "on tires, automobiles, sugar, wool, metals, rubber, etc. Women today are thoroughly sold on the idea of making everything last longer, and are wide awake to the fact that they may not be able to replace electrical appliances which have stopped functioning, are open to any suggestion to conserving their useful life."

Plan Now in Operation

New Orleans Public Service began establishing the Certified shops in September, when inspectors from the electrical departments carried the idea to dealers and looked over each shop. Qualifications for the Certified listing were: equipment to do all work, a moderately complete parts inventory, experience, trained men, and adequate facilities for handling varieties of appliances. It didn't matter whether the dealer was an appliance retailer or electrical contractor, since the shop only was involved. Consequently, Certified Electric Appliance Repair Shops in New Orleans range through appliance dealers, hardware stores, radio shops, refrigeration service firms and electrical contractors.

Twenty-one certified shops were appointed by the end of October. In March, there were 27—evidence of the popularity of the program.

Shops cooperating were furnished metal window signs bearing the "Certified" emblem, a certificate attesting to equipment facilities, and window cards. Promotional handout cards and mailing material is also furnished, which dealers can mail or distribute as does the New Orleans Public Service. A cartoon showing an infuriated man bringing a hatchet down on a burnt-out toaster launched the newspaper program used at the outset, titled "Don't Smash It—Let a Certified Electric Appliance Shop Repair It." A list of the shops followed. This cartoon was used in several newspaper ads, in statement stuffers, and in direct mail by dealers.

"Some dealers have been aggressively adding to the promotional pieces with ideas of their own," it was stated, "using the telephone, house-to-house calls and followups on appliance customers to boost the program in their own field." However, for the most part, the Certified theme has been the only "feeder" for many such dealers.

Results, now in the fifth month of the plan, are excellent. Contributing directly to keeping dealer's repair shops busy has been the innovation of house-to-house canvassing of New Orleans homeowners by Public Service for appliance repair. This practical plan was adopted in February, when the residential sales department put on the job 18 former appliance salesmen (all salaried employees) whose responsibility now is the selling of service instead. These men work in a single group, covering successively a single route from the more than 500 maintained by Public Service over the Crescent City. Thus centralizing canvassing operations and concentrating field supervision, the company is saving on gasoline and tires, as well as "working" a specific area to the last possibility before moving on to the next. This policy will be continued indefinitely although several men have been lost to the Army and Navy.

Saturation Data Obtained

Object of the house-to-house canvass is to line up actual work for Certified Appliance shops. Knocking on the door, the New Orleans Public Service salesman introduces himself as a survey representative disseminating "care and use" information on electrical appliances. He asks for permission to step inside and discuss economical operation of all home electrical appliances. During this discussion, he uses a specially-prepared form to jot down the name, address of the prospect, and the number, age and condition of her appliances.

"We stress the advisability of the representative actually getting his hands on the appliances," an official said, "since he can then demonstrate how to keep terminals from burning out, cords deteriorating, elements overheating, etc. He tells the housewife how to care for her washing machine, ironer, refrigerator, electric motors, pumps—everything except radios." Appliance connecting cords, incidentally, have been uncovered as the chief "sore spot" with the average housewife.

All this information goes on cards which are filed at the end of the day for future use in the Public Service sales office. Broken down into specific appliances, this information will be invaluable for the replacement market after the war is won, since it gives an adequate key to both the general and the specific market.

Going back to the actual contact, at the end of the conversation, the salesman attempts to get

This appliance service shop of the Romain Appliance Service, one of the certified shops, is typical of the others enrolled in this appliance service plan. At left, Jack Romain examines a defective part while his repair mechanic, Henry Solazino, looks over a washer undergoing repairs.

all appliances needing immediate repair into the customer's favored shop—showing her a list of certified service shops, conveniently printed for the purpose, and later left in the home. If the customer has no specific preference, the appliance goes to the nearest certified shop. If it concerns a range, washer, refrigerator, etc., too large to pick up, the information goes to the dealer the same day as a "lead." Customers are given a receipt, and courteously thanked. Any potential ill-will over high prices, etc., is eliminated in advance by asking dealers to telephone an estimate of the repair price to the customer before proceeding with actual work.

"The customer has the option to refuse to pay the price if she pleases," it was pointed out.

In this way, the crew is continually calling upon homeowner after homeowner. Each man averages 15 calls a day, making 270 contacts per day for the entire group. During March, the 18 men got 202 appliances in slightly more than 20 days, a low actual average from the physical standpoint, but far overshadowed by the importance of the "missionary work" itself. "Every housewife so contacted will remember the advice passed along, and can be depended upon to call in a Certified shop when the time comes," Public Service indicates. "Dealers are certain to benefit."

New Orleans Public Service itself benefits from the program by better dealer relations, conservation of vital materials and the elimination of waste. In every neighborhood covered to date, appliance service has skyrocketed immediately in related shops, enough to encourage cooperating

(*Continued on page 32*)

CERTIFIED REPAIR SAVES WEAR
Mrs. AMERICA!
CONSERVE VITAL METALS
Put Out-of-Repair Appliances Back to Work
Look FOR THE SIGN
COMPARE
HERE'S WHAT IT TAKES—
Free
CARE OF APPLIANCES
The Difference Is the Metal You Conserve by using the Service of a
CERTIFIED REPAIR SHOP

Typical of New Orleans Public Service window display promoting the "Certified Shop" idea.

Service Training Program Will Meet Dealers' Needs

WAR PRODUCTION BOARD orders which are bringing about the complete stoppage of manufacture, for civilian use, of refrigerators, washers and other major appliances and radios, have focused the attention of the trade in the Washington, D. C., area on the servicing of these commodities. Service and repair is now regarded as an important phase of industry, and retailers are now giving it more attention than ever before. It is predicted that from now on, servicing of major appliances will assume an even more important role in the operations of appliance retailers.

To meet this new situation, the industry in the nation's capitol city, under sponsorship of the Electric Institute of Washington, D. C., whose membership includes representative electrical wholesalers and retailers, has launched a program designed to help dealers of the nation's capitol city in meeting their repair and servicing problems. This program includes personnel, business standards, education of the consumer to the need of having these appliances serviced, profitable operation of service departments, and any other questions that may arise under changing appliance business conditions. J. S. Bartlett is managing director of the Electric Institute of Washington, and E. E. Samson, is his assistant.

It has been pointed out by the Electric Institute that the most urgent need in the refrigerator, washer and radio industries is that of suitable personnel for the satisfactory servicing and repair of appliances. More than ever before the demand for good servicemen is paramount. The committees of the refrigerator group, the washer group, the radio group, and the Board of the Institute, are meeting this need with a plan for training young men for the dealers.

Considering the demand for men by the various branches of our Government, it is further pointed out by the Electric Institute that it is believed that suitable service men can be trained among young men of high school age. Intensive refrigeration, washer and radio servicing and repair schooling in one of the District of Columbia vocational schools for a six-month period, during which the student would attend school for half a day and work the balance of the day for a dealer, under the supervision of an expert service and repair man, would develop a qualified bench repair man, it was pointed out. This apprentice would then become a first-class refrigerator, washer, and radio service man as he developed under the dealer's watchful care. The Chamberlain vocational school, in Washington, D. C., has been selected as the institution for this servicing instruction.

During the six months' training, the apprentice will attend Electric Institute meetings, to be held in the Pepco Building, the headquarters of The Electric Institute. Talks on business principles to acquaint the young men with the general problems of dealers, to make him appreciate these problems, will go a long way toward the making of a loyal service man. Improving his personality and ability to meet the public will also be a phase of the training. Awards of cash and valuable equipment, for proficiency, will hold the attention and build the enthusiasm of the apprentice for his job. In this way, the apprentice will not only have the ground work for his future life's work, but will better appreciate his moral responsibility to the organization for which he works.

In further describing this program for the training of young men for the important field of refrigeration, washer and radio servicing, the Electric Institute shows that the plan is an attractive one from the financial viewpoint. The student's earnings will, of course, depend on the hours he is able to spend in the dealer's store. The first few weeks he may only be able to become acquainted with the stock, removing motors or other parts from the cabinets, cleaning and such tasks. Later on, he will be able to repair the bulk of refrigerator, washer and radio troubles of a minor nature, and as he develops under the care of the dealer's expert, he will be able to handle the difficult jobs.

His earnings, according to the program sponsored by the Electric Institute, will be approximately as follows (based on 40 hours per week, the work-week running from 1 to 7 p. m., for five days and 8 a. m. to 6:30 p. m. on Saturdays): $17 per week for the first eight weeks, the Electric Institute con-

(*Continued on page 62*)

"That's our new line . . . but you can't get any of them!"

Dallas Electric Club Serves Members in Troubled Times

ONE OF THE most active organizations of its kind in the country, with a quarter of a century and more of active service behind it, the Dallas Electric club seems destined in these days of uncertainty, with more uncertainty the apparent lot of the industry, to prove to be a sort of melting pot into which the problems of the individuals may be poured and from it drawn genuine aid in one form or another in their solution.

The Dallas Electric club is a sort of admixture of the familiar luncheon club and trade association. It is a group with a membership now of approximately 225, bound together by their common interest in applied electricity. It departs from the ordinary trade association so greatly that in the more than 25 years of its existence it never has become affiliated with any such national group. It is confined in its activity to the city of Dallas, Texas, and Dallas County. Its purposes are both social and commercial. It reaches out far and wide and seeks to bring in every man in whose business of earning a living electricity plays a part of importance.

Actual Origin not Recalled

The club has been taken for granted for so many years that when some years ago a move was made to write a record of its development it was found virtually impossible to trace its origin. It simply had sprung into life, it would seem, and to have taken its place and progressed through the years, taken for granted as part and parcel of the community. The interest of the club officers in the past was enlivened in the month of January of this year when one of the newspapers published a cartoon recalling an event of 25 years before—the inauguration of one of its presidents, Howard Bramley. The newspaper account of the ceremonial, held in Hotel Adolphus, pictured it as probably similar to the coronation of some imperial potentate. Electric flash lamps were used by the attendants to illuminate the stage in the course of the ceremony. There were more than 200 attending the ball which marked the occasion on January 15, 1916. Records of the club uncovered by the quest for its beginnings showed that it was in active existence at least one year before.

W. W. Lynch, 1942 president of the Dallas Electric Club.

The club currently has a membership well in excess of 200. It is in no sense one limited to any number of members, nor to any fixed status of association with electricity of its members. As indicated, it reaches out as far as possible, and invites all who earn, directly or indirectly, from use of electricity, to join. The club is one of individuals, and distinctly of individualism, although every large corporation associated with the electrical industry is represented on the roster.

The club meets weekly, save during the summer months, in one of the leading Dallas hotels. Its meetings range from "utter foolishness," to quote Walter C. Blair, its present secretary and member of the Texas Power & Light Co. staff, to profound discussions of subjects in wide variety which may be immediately or remotely related to the electrical industry. Its constitution and by-laws state its purpose to be two-fold: to engender and beget a closer social relationship between persons eligible to membership, and to aid and assist them in commercial matters. The club is stated to be ready at all times to lend its hand in any community undertaking having as its purpose general welfare, no matter whether or not electricity or its use is involved.

The club has proven a point where information of vital interest to the vast organization of users of electricity funnels in and out, Mr. Blair says. Almost complete informality marks its meetings; but they invariably see groups of men of widely different interests ringed together in serious conversation. The very informality which obtains invites and nurtures this variety of discussion of individual problems.

The range of membership of the club includes representation of such corporation identities as Dallas Power & Light Co., Texas Power & Light Co., General Electric Co.,Westinghouse Electric and Mfg. Co., Texas Electric Railway Co., Dallas Railway Co., all of the leading manufacturers of electrical equipment, jobbers, retailers, school teachers, engineers, architects, builders, and contractors.

Subjects discussed by speakers at the club meetings are as varied as the speakers. Many of them might at first consideration appear remotely if, indeed, at all related to electricity or its applications. The informative value of them obviously is large. They serve to materially broaden the business and professional horizons of the membership.

The club seems destined to play an increasingly important role now that priorties and other intricates born of the defense program have come to plague the minds of business and professional men alike. It is becoming increasingly a cauldron of experience into which is channeled from almost every source facts which are of value to the men whose livelihood springs from use of electricity, its manufacture or application.

From standpoint of member interest, the club has been highly successful. Over the period in which meetings are held each year, attendance will be found to average approximate 50 per cent.

Thus far there has been no consideration given the suggestion that the club make it its business to try and help "officially" smooth the roads of the men engaged in the fields of electricity, says Mr. Blair, the secretary. More than likely, it

(Continued on page 64)

Utility War-Time Activities Theme of Annual Conference

WITH A PROGRAM made up entirely of business sessions on war-time subjects—all revolving about the most important task ahead, the winning of the war—some two hundred and fifty Southeastern utility executives heard speakers emphasize that the utilities are responding adequately to demands for power for war production at the annual conference of the Southeastern Electric Exchange, at Edgewater Park, Miss., April 16 and 17.

C. C. Curtis, retiring president of the Exchange, set the keynote of the meeting in his opening address: "We are at war," he said, "and if high resolve and prayer could remove the causes for war, and with justice and freedom assured to all end what we already know as World War No. 2, none of our future meetings would be referred to as war-time conferences. But, of course, that is too much to hope for. Many intelligent men prophesy this war will last for a minimum of five years and a maximum of ten. That guess is as good as any and we may as well make our plans accordingly. If it is ended sooner, nothing will have been lost by reason of our overestimating the size of the task ahead of us.

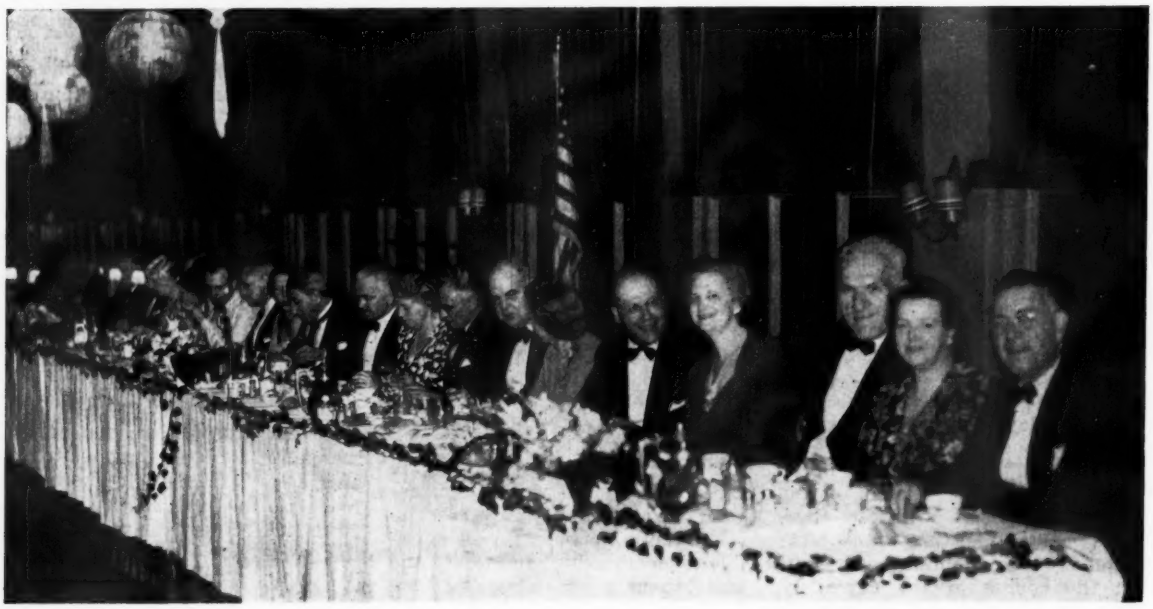
"None of us like war. Most of us can sympathize with sentiments of pacifists, but only up to a certain point. Then stark reality and necessity erect themselves in front of our eyes and we are faced not with a beautiful theory but with the need for militant action. This war is not of our choosing, but now that it has been thrust upon us by nations and peoples intent on imposing their rule of force and cruelty over all men, we have but one choice—fight and fight and fight until victory is achieved for the United Nations and our American principles of freedom and justice for all.

"That is the thought in the minds of every one of us, whether consciously or subconsciously — during every waking hour, and has been since the horror of Pearl Harbor on December 7th.

"We are not going to think only of war—we are still going to laugh and play and keep fit and enjoy life and keep our sense of humor —but we are going to keep our sense of proportion also. A decent sense of proportion indicates that over and under and above and around and pervading all our thoughts and actions there will stay with us the cold, hard, relentless, driving determination to win the war. All else takes second place. When in doubt as to which of two or more things is the best to do, we will make the choice in favor of that which will lead to victory of our armed forces in World War No. 2. On this I feel sure we are all united."

Power Pooling in the National Emergency

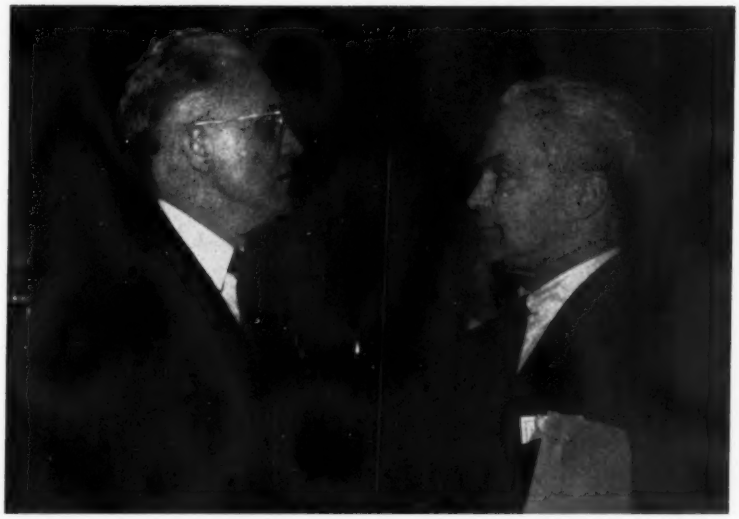
The need for strategy and accurate planning and competent leadership is no longer confined to our armed forces but is of equal importance on the far-flung civilian front, Walter R. McDonald, chairman of the Georgia Public Service Commission, told the conference in his talk on "Pooling and Allocation of Power in the National Emergency."



"Definite responsibility for an important part of planning and leadership rests upon the management represented by your membership, for industry in the war production is increasingly dependent upon electric energy as its source of power. Power plant expansion, to meet the ever-increasing load which has admittedly reached the critical point of overloading in at least two regions of the country, is definitely restricted by the scarcity of critical materials as well as the limitations of the manufacturers. It is therefore timely and essential that you should look to the potentialities of power pooling and make plans for the days of possible power rationing in the event of a long drawn out war.

"The general plan for power pooling is now well known. As part of Limitation Order L-16, some forty public and private electric systems in thirteen states were required to pool their facilities in order to generate the maximum output, conserve water in storage and bring increased supplies of power into the shortage area. The pooling arrangement was planned in detail by the Atlanta office of OPM in collaboration with the State Commission experts and was supervised by that office. Throughout the period of operation of the Atlanta office the engineers were in daily and frequently hourly consultation with the various systems participating in the pool in order to work out the numerous engineering and operating problems which arose constantly. The power pool was a great success. It established a precedent for cooperative action over a wide front, which will be of incalculable value in helping to meet other shortages in other sections of the country during the national emergency."

"The Utilities Responsibility in the Emergency," was the subject of a comprehensive address by Harold F. Smiddy, chief sponsor, Ebasco Services, Inc., New York City. He pointed out that no war load has yet been shut down for lack of electric power and that none needs to be. The power issue, like the labor issue, the farm issue, and every other such issue, ought to be taken out of politics for the duration, he said, and while the job of outlining general war power requirements should be centralized and streamlined as to basic scope and objectives, the work of *meeting* such requirements fully and on time should be *localized* in the service territories of the operating systems. (A more complete abstract of Mr. Smiddy's address appears on page 9 of this issue under the heading, "Power for War Production.")



L. P. Sweatt, vice pres. and gen. mgr., Mississippi Power Co., Gulfport, was named president of the Southeastern Electric Exchange at the concluding session of the conference. C. C. Curtis, right, pres. of Savannah Electric & Power Co., has been president during the past year. Other officers elected at the annual conference include: first vice pres., Rex. I. Brown, pres., Mississippi Power & Light Co., Jackson; second vice pres., R. Paul Smith, pres., Northern Virginia Power Co., Hagerstown, Md.; and third vice pres., E. L. Godshalk, pres., South Carolina Power Co., Charleston.

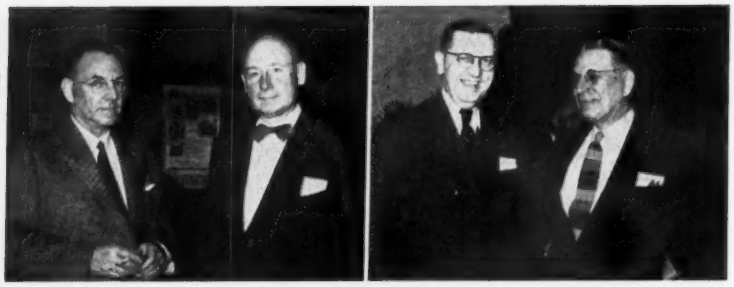
Speed Urged in War Production

"Your executives have an overall knowledge of industry that is unique; your representatives know and are known to the operators of practically every plant, factory and shop in the nation. In many cases they have not only knowledge of the machines and other manufacturing facilities of industries in their areas, but also a keen appreciation of the abilities of the men who manage and operate them," said W. H. Wheeler, Jr., Chief Contract Distribution Branch, War Production Board, in an address on "Converting Civilian Production to War Production." Because Mr. Wheeler was unable to attend the conference, his address was read by R. E. Judd, state director for the Contract Distribution Branch, WPB, at New Orleans.

Since Pearl Harbor, all practical manufacturing facilities are badly needed. Under pre-war conditions, the facilities of many moderate and small-size plants were "sub-marginal" for munitions production as their equipment was not as adaptable as larger plants. The majority of small plants can only be used through sub-contracting or pooling operations, both of which substantially increase costs. "But speed—not cost—is now the determining factor," stated Mr. Wheeler. "Under changed conditions," he said, "small business as a whole should fare much better. Large or small, every manufacturing plant must find its proper place in the war economy."

In pointing out the difficulties encountered in obtaining the maximum use of production facilities in 1942, Mr. Wheeler emphasized the importance of the utility representatives due to their close contact with industry and industrial resources. Mr. Wheeler cited many instances of manufacturers converting from peace-time to wartime production "belying the statement that U. S. mass production, because of its single purpose machinery, is not flexible and cannot readily convert."

"Recent expansions are insurance against future needs," Mr.



Left to right, R. J. Throckmorton, vice pres., Virginia Electric & Power Co., Norfolk; Davis M. Debard, vice pres., Stone & Webster Service Co., New York City; John W. Talley, exec. secy., Southeastern Electric Exchange, Atlanta; and A. W. Higgins, pres., Florida Power Corp., St. Petersburg.

Wheeler said, "but of greater importance is our production now, in the remaining months of 1942, with the tools that we have.

"This can be done in two ways—bringing the tools to the work, or the work to the tools. Where the tools can be brought to the work by sale to the prime contractor, this is usually the method to follow, provided he has the floor space for them, and provided the subtraction from a complement of machine tools existing as a nucleus elsewhere does not destroy the utility of that nucleus.

"Cost under the present emergency conditions is no longer the gauge of efficiency. It is definitely inefficient and obstructive to limit or restrict production because of that factor. Most new contracts now are being negotiated so that all fair and reasonable allowances for increased costs which contribute to speed, may be made. Existing contracts taken on a fixed price basis may be, and should be, reopened where more speed in production can be obtained, if provision is made for a reasonable increase in cost.

"Many outstanding and inspiring jobs have been done both in mass production and in "bits and pieces". One manufacturer turning out guns and doing it well, undertakes only 7% of the work in his own plant. The rest is farmed out to smaller factories which can make required parts on existing machines. A group of small metal working establishments in Denver, Colorado, banded together in a pool and have secured some seventy millions of dollars in contracts from the Mare Island Shipyard, for the fabrication of plates, frames and other structural metal work for the pre-fabrication of ships a thousand of miles from the sea. A ladies' purse manufacturer is making parts for a gun; a merry-go-round manufacturer is making air-craft handling equipment; a heater manufacturer is making bogey-wheels for tanks—and so it goes. And in Detroit the automotive industry is doing an outstanding job, belying the statement that U. S. mass production, because of its single-purpose machinery, is not flexible and cannot readily convert. The mental muscles of its engineers are flexible, and their ingenuity is producing results which are amazing.

"Yes, we'll do the job allright, despite our seeming conflict and confusion—and we'll do it in the democratic way in which this great Nation has always met its emergencies. But it won't be without the greatest effort and sacrifice by all of us."

"New Approaches in Advertising," were discussed by Clayton Rand, editor of the *Dixie Press*, Gulfport. It was his opinion that public favor was turning toward the privately owned utilities and that this changing condition could be utilized advantageously by the utilities in their public relations and advertising.

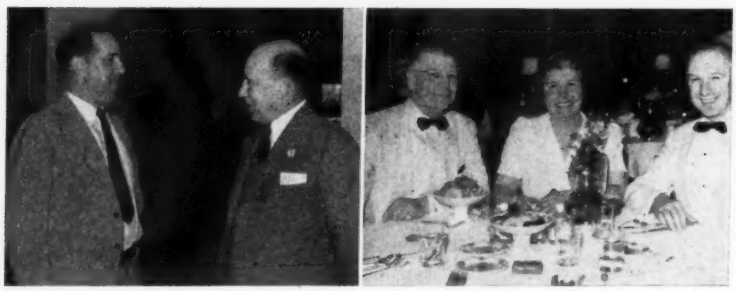
Samuel G. Hibben, director of applied lighting, Westinghouse Lamp Works, Bloomfield, N. J., concluded the Thursday afternoon session with an address and demonstration on "The Partnership of Light and Darkness in National Defense."

The annual dinner meeting, over which President Curtis presided, presented Dr. Nathaniel Peffer, of Columbia University, in an address entitled "America and the World Conflict." Dr. Peffer's intimate knowledge of the Far East enabled him to present an interesting discussion of present world conflict.

Industrial and Utility Operations in War Time

Drawing upon observations made during visits to England and from many authoritative sources in Great Britain, Davis M. Debard, vice president, Stone and Webster Service Corp., New York City, presented a factual discussion on what is being done in England with regard to civilian protection and industrial and utility operations under war-time conditions.

"When the English utilities found that war was inevitable," Mr. DeBard said, "they set about to train their employees, from office boy to president, in just what part they must play when their plant and distribution system suffered from fire and bombing. I observed some of these training classes at the British Gas Light and Coke Company, Field Laboratory, the Watson House, located on the outskirts of London, where several hundred employees were placed at windows on 2nd, 3rd and 4th floors of adjacent



Left to right, MacGregor Smith, pres., Florida Power & Light Co., Miami; S. P. Vecker, vice pres., Carolina Power and Light Co., Raleigh; A. H. Jaeger, manager Utility Division, Hotpoint, Chicago; Mrs. Mary Hagan, Southeastern Electric Exchange; and Fred Holz, associated with "Reddy Kilowatt," New York City.

Left to right: (1) S. P. Vecker, vice pres., Carolina Power and Light Co., Raleigh, N. C.; H. F. Smiddy, head of operating section, Ebasco Services, Inc., New York, N. Y.; and H. H. Blakeslee, manager General Electric Co., New Orleans, La. (2) T. J. Fleischer, vice pres., Walker Electric Co., Atlanta, Ga.; and C. B. McManus, asst. operating manager, Georgia Power Co., Atlanta. (3) L. P. Sweatt, vice pres. and gen. mgr., Mississippi Power Co., Gulfport, Miss.; B. E. Eaton, pres., Mississippi Power Co., Gulfport, Miss.; and F. A. Newton, chief of rate division, Commonwealth & Southern Co., New York, N. Y. (4) J. A. Whatley, dist. mgr., Ohio Brass Co., Atlanta, Ga.; and C. S. Thorn, vice pres., Birmingham Electric Co., Birmingham, Ala. (5) A. C. Smith, div. auditor; E. E. Burkett, div. auditor; Dana King, adv. mgr., all of Mississippi Power Co., Gulfport, Miss. (6) L. M. Smith, elect. eng., Alabama Power Co., Birmingham; and R. S. Griffith, mgr. Central Station Dept., General Electric Co., Atlanta. (7) J. M. Stafford, asst. adv. mgr., Georgia Power Co., Atlanta, Ga.; and C. A. Collier, vice pres., Georgia Power Co., Atlanta, Ga. (8) D. S. Kerr, dist. mgr., Allis-Chalmers, Atlanta; and H. J. Goers, sales engineer, Aluminum Co. of America, Atlanta. (9) S. L. Muths, operating mgr., Mississippi Power Co., Gulfport, Miss.; and L. T. Smith, Jr., sales promotion mgr., Gulf Power Co., Pensacola, Fla. (10) W. B. Creech, mdse. mgr., Westinghouse Electric & Mfg. Co., Atlanta; C. H. Guy, asst. sales mgr., Westinghouse Electric & Mfg. Co., Mansfield, Ohio; and Eugene Leier, com'l. mgr., South Carolina Electric & Gas Co., Columbia, S. C. (11) W. E. Mitchell, vice pres., Georgia Power Co.; W. P. Hammond, chief engineer, Georgia Power Co., Atlanta; and E. D. Early, eng., Commonwealth & Southern Co., Birmingham, Ala. (12) E. S. Fitz, gen. mgr., Electrical Dept., and J. T. Chase, vice pres., both of Virginia Electric & Power Co.; and H. V. Whitney, General Electric Co., Richmond, Va.

buildings while actual bombing in an open field was carried out on gas mains which, after the explosions, set fires in a number of dummy houses. Valves were turned to shut off gas and different methods of fire fighting were demonstrated and repairs were started. This was to give the employees a first-hand picture of actual bombing conditions. This training was, of course, carried on for many months and some 16,000 employees in this one large company knew exactly the part they were to play under bombing conditions.

"Second, various types of camouflage were used to make plants more difficult to spot from the air. This was worked out in conjunction with the British Air Force which made observations at various levels. A new smoke and fog camouflage has been developed that will blot out a blast furnace, electric or gas plant, from the air pilot's vision within a few minutes' time after first flash of air raid signal. The usual fencing of property, protective walls, additional guards, a pass system for employees and other methods of protection were resorted to.

"Blackouts, which from the outbreak of war have been complete blackouts all night, every night, every place, are obtained in homes, stores, factories and power stations by total screening of windows, skylights, doors and other apertures against the egress of light from within. Full inside illumination is encouraged. Darkness inside homes would be bad for morale. Darkness inside buildings and factories would hold up production. Warning periods are frequently of long duration, and would be longer still if the enemy knew that he could paralyze activity by sending "nuisance" planes.

"Third, electric distribution systems were sectionalized, with a number of connections to main source, and all isolated generating plants in the area were required to be interconnected to the central station system in order to furnish emergency current, should the main source be interrupted. Practically all central station generating plants wherever possible, are connected with the 132 kv grid system. Gas distribution systems were likewise interconnected with other gas companies wherever feasible. Utility interconnections so widely practiced in America have proved of great value in maintaining service during the war in England.

"In order that production may not be unduly delayed, in cases of bomb damage, most industries have a supply of essential spare parts for their machines. The British Grid, when the war began, in cooperation with the operating electric companies, purchased some 10 million dollars worth of spare parts, such as, switching apparatus, transformers, copper wire, regulators, etc., and placed these in bomb proof shelters in various sections of the country easily accessible.

UTILITY ACTIVITIES UNDER WAR-TIME CONDITIONS—The demonstration booth, shown above, of the various defense precautions against air raids has attracted much interest in the Miami offices of Florida Power & Light Co. The exhibit includes a blackout booth for demonstrating phosphorescent materials that glow for several hours after being activated by light. Below, a Florida Power & Light Co. employee points with pride to the campaign chart indicating that what was originally planned as a ten-week drive to get employees in the government plan of salary allotments for war savings bonds closed one day after it started with 100 per cent participation by the company's 1700 employees.

Few Serious Outages

"After two years of bombing it is reported that repairs have been made with such speed that comparatively few customers are without service within a 24-hour period. The gas companies made additional main connections and installed many hundreds of additional valves so that small sections could be isolated quickly and easily. Retaining walls were erected around generators, vulnerable switching apparatus and auxiliary machinery; station pilot lights were installed. In case of a bomb damaging the roof the power station could continue to operate without any light emitting through the hole.

"After a study of reports on the affect of some several hundred different bombings of utility property, it is amazing the small amount of damage that was done and how speedily the repair gangs were able to restore service. From this study, I note that:

"1. A quick inspection by a small, competent crew is necessary.

"2. Heavy gloves for clearing debris and rubber boots, on account of broken water mains, are necessary.

"3. Gas pressures are reduced in the bombed area.

"4. Gas companies use, for stopping the flow of gas, mud balls, cones, or ball plugs, or, the bag-off system, which, as you know, is drilling a hole in the pipe, inserting a deflated balloon which is blown up.

"5. Portable water pumps are required due to flooding of bombed craters and mains.

"6. Steel pipes under concrete road will flatten and cast iron pipes will crack far greater distances than will steel or cast iron pipes when bomb hits tar or gravel road.

"7. The most valuable squad around the gas plant is the trained fire squad. Around an electric plant is the trained electric repair squad who have worked out complete plans for repairing every type of damage.

"8. Anti-aircraft shrapnel, while it may injure roofs, does not pierce the tops of gas holders. Bombs when exploding are said to scatter into about 2,000 to 6,000 pieces. The most destructive bombs are the 2,000 to 3,000 lb. land mines which float down on a parachute, exploding on earths surface. These will level as much as four blocks.

"9. Many electric and telephone cables have been found to stretch and not break, even though they are on craters edge."

Window displays, newspaper advertising, and many department activities of the New Orleans Public Service, Inc., are being streamlined to meet the needs of wartime conditions. The window display above features the company's Certified Electric Appliance Repair Shops campaign which has as its purpose not only the maintenance of domestic appliances in good condition, but also the origination of appliance service work which will enable local dealers to remain in business for the duration. The window display shown below, which deals with the subject of nutrition, is typical of other wartime activities of this company.

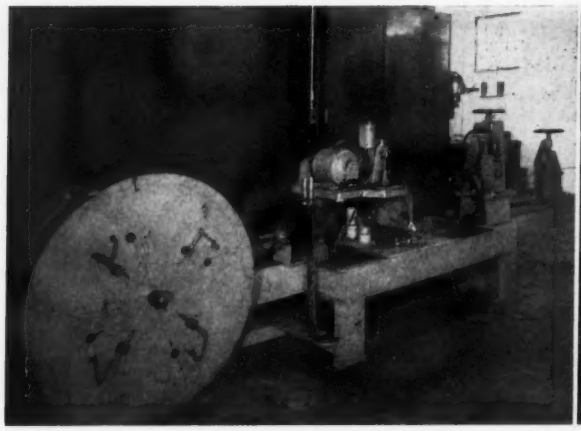
Winning Peace More Important Than Ever!

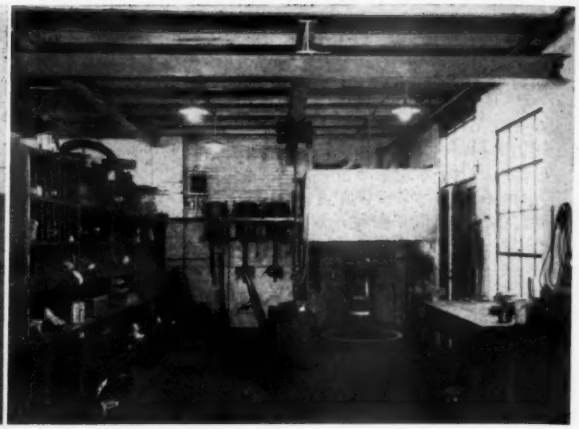
Winning the war must be our first concern, Stuart M. Crocker, vice-president of General Electric Co., told the conference, but managers of business and industry have an equally important duty: winning the peace that follows through planning for the future.

"It behooves each and every company not only to prepare definite and complete advance plans for itself, but to encourage all companies within the same industry—and in all industries—to do likewise," Mr. Crocker urged the conference.

"It is reassuring to know that many of the larger companies have taken this with utmost seriousness. Our Company with its many businesses in the electrical field have selected some of our best brains and have made it their first responsibility. Parenthetically, I might add that the laying out of such a program does not necessitate large numbers of men who might otherwise be engaged in war production. It takes a small group of practical men possessing intelligent optimism and at the same time having full knowledge of the facts. They must have an enviable record as doers, retaining, still, intelligent optimism.

"During the meetings that I have attended with our Advance Planning group in the General Electric Company I have heard many things which give me great courage as to the future of your industry. Some of our wisest engineers whose opinions have been checked and double-checked by others believe that your individual advance plans should include a survey of the post-war demands of industrials within your territory. They believe that many companies who have been forced to reduce their production because of lack of priority business will be in the market afterwards promptly for cheap power as well as new



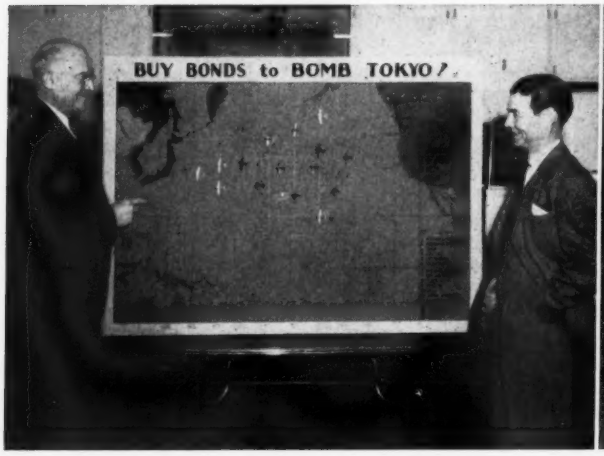


Salvage and reclamation operations are progressing most satisfactorily on the properties of the Virginia Electric & Power Co., Richmond. At left, a machine designed to reclaim scrap wire. It combines the functions of splicing short lengths of insulated wire and the stripping of wire of worn-out insulations. At right, a view of the transformer repair shop which includes facilities for making both voltage and insulation strength test on transformers.

equipment. To regain their position after the war in the highly competitive conditions which will then exist, they will require the most modern equipment and the greatest use of electrical energy as against manual labor.

"In addition to that potential market, our engineers point out an entirely different market which after the war will open up to the Utility companies. The generating equipment of industrials now engaged in war work is being driven as never before on an around-the-clock basis. Its obsolescence is terrific. It is not beyond reason to expect that if the war lasts for four or five years most of this generating equipment will have outworn its usefulness from the point of view of low-cost power production. Here is another market which will be open to the power and light industry if they are on the job.

"There has been much talk about the great danger to the steel industry from the aluminum industry after the war. I thought it would be interesting for me to mention certain conclusions that our engineers have arrived at about this much-publicized discussion in the press. They point out that it should not be too alarming to the steel makers because after all the annual production of aluminum after the war will be, say, one million tons, as against 100 million tons for steel. Now, to produce a ton of aluminum takes, say, 20,000 kwh, and to produce a ton of common steel takes about 200 kwh. It is their belief that the challenge to the steel industry will be met by their increasing the production of electric furnace steel, which will take four times as much electrical energy to produce as open-hearth steel. And, as I have said before, if the generating equipment of the steel industries is worn out to inefficiency, then in this case both the electrical manufacturers and the local Utility companies have a



Bond buying and material conservation are among the principal themes of Birmingham Electric Company's wartime activities. Lewis F. Jeffers, war savings official, shown at right in the photo, looks over the Birmingham Electric Company's employees' bond-buying contest poster. H. E. Cox, vice president, of Birmingham Electric Co., explains the poster which utilizes small planes progressing from the United States towards Tokyo as war bonds are purchased. At right, a wire-stripping machine recently purchased to salvage copper wire. The company has featured this photograph in its advertising with the heading "Enough Copper to Make Bands for 17,564 Shells."

chance to supply such industries with not only electrical equipment but with an outside source of power with which to run their plants.

"As with all of their considerations, our Planning Committee, insofar as it relates to our particular problems, approach their task as to how we can continue to employ 130,000 employees who will shortly be producing for us at the rate of $900 million to one billion dollars a year. Section by section the Committee has consulted and planned with the responsible group. The results today of redesigns of standard lines, new products and new inventions now in the hands of our General Engineering organization indicate that if all industry is able to make the conversion from war production to peace production with promptness, due to advance planning, we of the General Electric Company should be able to retain all of our employees. No company can do this alone, nor can any one industry do it alone. Advance planning must be done by private industry the length and breadth of the land. The war itself has proven again that we cannot insulate ourselves from our neighbors and thus save our hides. Our neighbor can destroy us with as equal certainty as we can ourselves. Our only hope is to arouse not only ourselves but our associates in other positions of leadership to the need for advance planning which I have desperately tried to make you believe is now more important than ever."

Maintaining Good Will During the Emergency

Bringing the conference to a close with note of practicality, Charles A. Collier, vice-president, Georgia Power Co., whose subject was "Maintaining Good Will During the War Emergency," urged the continuance of advertising and customer contact.

"The most important job every man and every business has today is *winning the war*. That comes first! And let's make no mistake about that.

"But when you get down to realities, the biggest problem of all that faces us is, how can we hold on to the loads we have built, and for the building of which we have spent millions of dollars of our capital.

"It is important, also, to maintain a *balanced* load. An ideal balance is one-third residential, one-third commercial, and one-third industrial. Right now, of course, industrial loads are out of proportion to the others. This makes it even more important for us to hold on to as much as possible of the commercial and residential loads.

"Now that may strike you as somewhat out of line with the subject. But it is not at all. As a matter of fact, if such a chart were possible to make, I'll venture that a load-growth line and a good-will-growth line would come close to being one and the same.

"We have found that our most satisfied customers are the ones who make the fullest use of our service. And that our least satisfied customers are the ones who make the smallest use of our service. The reasons are obvious. Our rates are so constructed that the more electricity a customer uses, the less it costs per unit. We call them inducement rates. And they were so named because they induce customers to use more electricity. They might just as easily be called good relations rates, for they build better relations, too.

"Full utilization of our service and customer good-will are so en-

(*Continued on page 65*)

Typical of salvage operations conducted by the Electric Power Board of Chattanooga is the scene above where every item of pole line hardware, insulators, etc., are examined for reuse, reclamation, or salvage as scrap. Below, one of the five classes in Red Cross standard nutrition being taught by home economists of the Electric Power Board in the auditorium of the home service center in the Board's recently completed "Electrical Center."

Oklahoma Utility Executives Hold Annual Convention

ELECTRIC and gas utilities, meeting at Oklahoma City, March 23 and 24, in the Twenty-Fourth Annual Convention of the Oklahoma Utilities Association, through speakers and discussion, expressed a determination to meet all demands upon them for power and fuel to keep national defense plants operating.

The keynote speaker, Charles T. Evans, Arkansas Power and Light Co., Little Rock, Ark., warned the delegates that while making an all-out effort to win the war, public utilities should guard fundamental principles of free enterprise and oppose the spread of communistic or totalitarian principles. Mr. Evans was the speaker at the annual dinner of the association, held Monday night in the Biltmore Hotel, attended by about 350 public utility executives and employees. J. C. Happenny, Oklahoma Power and Water Co., Sand Springs, first vice president of the association was toastmaster.

"We must work, we must pay and must furnish the man power to industry. I do not believe that labor union men are less patriotic than other people but we must give not only forty hours per week, but 50 and 60 hours if necessary toward production in this war," Mr. Evans said. He warned that public ownership ideas, especially of electric light and power facilities, are being taught by propagandists. He counseled utility executives to examine the text-books in the schools of their states and communities to see if such theories are being taught to their children.

Such government dam projects as TVA and the proposed Arkansas River Authority were criticized by some of the speakers. Elmer T. Peterson, editorial writer, Daily Oklahoman and Times, of Oklahoma City, declared that public utilities, especially electric light and power companies, had been exposed to public ownership propaganda in recent years.

Public utilities, if they found it necessary to win the war, would give in to government ownership or operation temporarily, Mr. Peterson declared, but they would be derelict in their duty if they should give up their right to individual initiative after the war. "Many developments in our government are driving at top speed toward state socialism" the speaker continued. "Unimpeachable engineers have proven that steam power is much cheaper than water power, and more dependable. The TVA failed through drought at the very time when its output was needed the most. The only way such projects can give the public lower rates is to charge back a large part of operating costs to flood control. With 79 billion tons of coal in the ground and three trillion cubic feet of natural gas in reserve in Oklahoma with which electricity can be generated, present attempts to ram the $250,000,000 AVA down our throats is sabotage in a grand manner," declared Mr. Peterson.

The speaker advised public utilities to unite on uniform rules and regulations to lessen confusion and misunderstandings among customers who deal with several companies, or who remove from one place to another.

Through presentation of illuminated slides, R. W. T. Purchas, Middle West Service Co., Chicago, Ill., presented figures on supply trends and rising costs of critical war materials from 1940 to 1942. War expenditures, actual and authorized as of March 15, 1942, he said, were 145 billion dollars. The only bottle neck at this time was in machine tools plant capacity and that condition soon will be remedied, the speaker predicted. He estimated that increase of the basic work week to 48 hours would be equivalent to adding 2,000,000 men to war plants. An increasing scarcity of certain vital materials available for civilian uses was shown by charts covering 1940, 1941 and thus far in 1942. These charts also showed steadily rising price levels of such materials.

Governmental projects which do not contribute directly and vitally toward winning the war, should be abandoned in the opinion of D. I. Johnston, attorney, Oklahoma City, who addressed the convention on "The State of the Union." "There is but one goal and that is for the United States to lead the way in this war, otherwise there is no hope," the speaker declared. "There is no sacrifice we should not be willing to make to win but we also must correct some internal things. We must guard against too much centralized control by our government."

Mr. Johnston referred to recent nation-wide prosecutions of cor-

Left to right: E. C. Joullian, second vice president of the Association; J. C. Happenny, Sand Springs, first vice president; W. L. Woodward, Alva, Association president; and Elmer T. Peterson, Daily Oklahoman and Times, speaker.

porations for alleged violations of anti-trust laws. These prosecutions have cost these firms millions of dollars in fees. All but one of these industries is producing equipment and materials vital to winning of the war. The suits have slowed down these industries from 10 to 30 per cent. Mr. Johnston also declared that the "little people" of this country have invested billions of dollars in public utilities and still there are public officials who wish to create more power dam projects such as TVA, using money paid by the public to the government in taxes to compete with the investments in these utilities.

The speaker declared that the government cannot operate these projects successfully unless it appropriates gigantic sums for standby plants. The argument that flood control is furthered by power dam projects was declared to be a mere pretext by the speaker. He pointed out that rivers, such as the proposed AVA would be supposed to control, are continually filling up with silt behind such dams as now exist. He cited the North Canadian river up-stream from the Lake Overholser dam at Oklahoma City as an example of how silt has accumulated until the bed of the stream above the dam has been made shallow, causing thousands of acres of rich second-bottom lands to be inundated as the result of ordinary rises in the stream last fall.

E. J. O'Connor, Associated Industries of Oklahoma City, reviewed industrial trends in Oklahoma stating that distance from principal markets, restrictive state laws and rapid growth of cities creating heavy advalorem indebtedness, had contributed toward holding back industrial development in the state. He showed, however, that Oklahoma is rich in raw materials and predicted that after the war more industry will be located closer to such materials and where labor is more friendly.

Electric and gas utilities were advised by Major I O. Hagen to make careful studies of all their employees under 45 years of age and determine which of these they cannot spare without slowing down the essential services of these industries in furnishing power and fuel to war plants. Major Hagen, who is connected with Oklahoma Selective Service headquarters, at Oklahoma City, advised utility execu-

(*Continued on page 62*)

Left to right: S. I. McElhoes, Southwestern Light and Power Co., Chickasha; R. K. Lane, Tulsa, retiring president, Oklahoma Utilities Association; and Charles T. Evans, Arkansas Power and Light Co., Little Rock, Ark., convention dinner speaker.

Left to right: Frank J. Meyer, chairman, Electric Light and Power Division; Miss Kate A. Niblack, secretary, Oklahoma Utilities Association; J. P. Arnold, Public Service Company of Oklahoma; and D. S. Kennedy, Association Treasurer.

Left to right: George A. Davis, Oklahoma Gas and Electric Co., Oklahoma City; R. W. T. Purchas, Middle West Service Co., Chicago, Ill.; and D. C. McKee, Empire District Electric Co., Joplin, Mo.

War-Time Problems Feature Utility Engineer Meetings

DISTRIBUTION and transmission engineers of the electrical utility companies have been busily engaged in devising ways of making electrical systems last longer and carry increasing wartime loads. A survey of papers and discussion presented at recent engineering meetings indicates that operations under wartime conditions has been the dominating theme.

These meetings included the spring meeting of the Engineering and Operation Section of the Southeastern Electrical Exchange at Raleigh, N. C., March 12 and 13; the winter convention of the American Institute of Electrical Engineers in New York City, January 26-30; and the twenty-sixth meeting of the Transmission and Distribution Committee of the Edison Electric Institute, October 20-22.

Although held some six weeks before Pearl Harbor and United States entrance into World War II, the deliberations at the EEI T & D meeting gave evidence that electrical engineers were already deciding on ways to conserve priority metals and manpower.

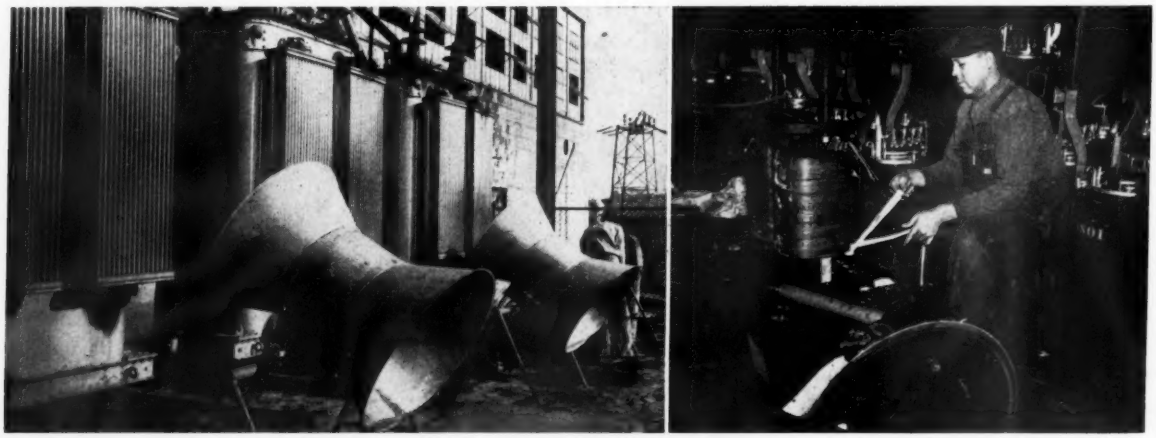
In his talk on "Expanding Electrical Systems for Defense," S. M. Dean, of Detroit Edison Company, summarized the necessary procedure as this: (1) survey our areas carefully to determine probable load requirements; (2) know the limits of our lines and equipment; (3) plan far in advance and, where necessary, design and make commitments in advance; (4) build as little as absolutely necessary and defer that as long as may safely be, to insure the need for it and to increase its permanent usefulness; (5) minimize maintenance, inspection and improvements; (6) cooperate sympathetically with the government to insure the best over-all use of materials and labor.

The Power Situation

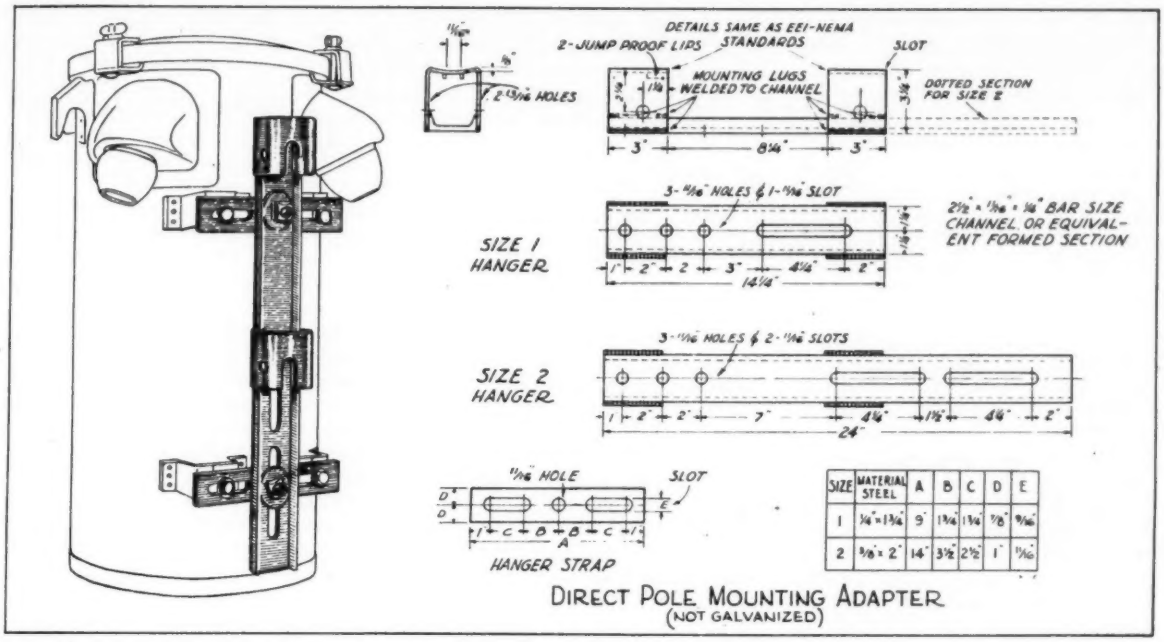
On the subject of government cooperation, C. W. Kellogg, president of the Edison Electric Institute, said this in closing his address on "The National Power Situation": "Speaking as one who spent a year on the job in Washington, I can assure you that things often look different when you are working for the government than if you are on the outside applying to the government. You are all experts. Use your imagination as to what *you* would want to know if *you* were representing the government and had to pass on your own application with only such information as it alone contained."

Earl H. Kendall, of Commonwealth and Southern Corporation, discussed "Metal Shortages and Their Effect on Line Hardware" at the EEI T & D meeting. "A greater reduction in the steel and zinc requirements for power construction can be made by the use of wood than by any other change without less strength and life, with improved operating characteristics, and at a lower cost," he said. "Wood pins can replace steel pins on distribution; wood braces can replace steel braces; wood guy-guards can replace steel guy-guards; wood H-frames can replace steel towers, and wood substations can replace steel substations."

Mr. Kendall pointed out that "various methods for increasing the corrosion resistance of steel have been used to a greater or less extent," in view of the shortage of zinc. Methods he described were cadmium plating, chromizing, and lead and lead alloy coatings. The latter have been used "largely as protection against



Typical of the means and extremes to which power men must go to move the kilowatts where most needed and in the quantity required is the substation at the left operated by Louisiana Power & Light Co. Increased loads of a large industrial customer loaded transformers to a point where blower fans were required. The installation shown is expected to lower temperatures approximately fifteen degrees. Right, same company's transformer rebuilding shop.



SIZE	MATERIAL STEEL	A	B	C	D	E
1	¼" x 1¾"	9"	1¾"	1¾"	⅞"	9/16"
2	⅜" x 2"	14"	3½"	2½"	1"	11/16"

A suggested standard for the adapter plate for use on old transformers is shown in the accompanying drawing. This was originally shown at the May, 1941, meeting in Chicago, and some modifications have been made. There has been considerable interest in this adapter and several companies have ordered them from the manufacturers. It seems desirable that there should be adopted, as soon as possible, a standard for this item that will meet with general approval and, if possible, avoid the confusion of having several or many individual designs. The only difference in requirement that has come to attention thus far is in the depth of the mounting lugs, which is shown on the accompanying drawings as 3¼ inches. Dimensions on this have varied from 2¼ to 3¼ inches.

the corrosion effect of chemicals. However, recent research of such coatings, as indicated by the ASTM A-5 Corrosion Report, indicates a wider field of application is possible. . . . These coatings are of considerable interest at this time, both because of the good corrosive resistance and because the supply of lead is more plentiful than zinc."

"When properly applied," Mr. Kendall said, "better paint coatings will give the necessary protection to steel structures for five to ten years, depending upon atmospheric conditions, which is in some instances equivalent to the life of zinc coatings in the same locations. Based upon the results obtained, it is believed that such coatings are logical substitutes for zinc, either on new work or to replace rusted zinc coatings on present equipment. To secure the maximum life from any paint coating, it is necessary to properly prepare the surface and to select the proper type of paint for the particular application.

"Some of the most widely used methods for cleaning and preparing steel surfaces prior to the application of the paint coating include one or more of the following: sand blasting, flame cleaning, wire brushing, scraping and chipping, parkerizing, bonderizing and other phosphate treatments.

"Sand blasting is one of the most effective ways of removing rust and mill scale, but this method requires elaborate equipment and introduces a high cost factor which cannot be justified on many applications.

"Flame cleaning is being used more extensively, particularly on structural sections. Wire brushing is undoubtedly the most common method, and while it does not produce as clean a surface as sand blasting, satisfactory results can be obtained. The removal of mill scale on new steel is essential and is usually done either by sand blasting, acid pickling, or weathering. An interesting point in connection with the weathering method is that a coat of linseed oil over the mill scale will accelerate the removal of the scale and leave a good surface for the paint coat.

"Parkerizing and bonderizing and other phosphate coatings, which are used extensively in automobile production, produce a roughness or tooth on the surface of the metal, and thereby increase the adherence of the subsequent paint coatings.

"Although there are some paints for steel on the market that are recommended as one-coat paints, most paints consist of primers and finishes, or systems. The primer coat for steel should contain a pigment which has rust-inhibitive characteristics and makes steel passive to oxidation, thereby reducing the rate of corrosion. The final coat is applied to prevent moisture from penetrating through to the metal surface, and to improve appearance. The type of finish, or top coat, to be used depends to a large extent on the service to which the painted material is subjected."

In his paper before the EEI T & D Committee, Frank Sanford explained how "Direct Comparison Leads to Direct Mounting of Pole-Supported Transformers" by his company, the Cincinnati Gas and Electric Company. He pointed out that "the Joint Committee on Standards for Distribution Transformers has endorsed the development of a uni-

versal adapter, and with this sponsorship, a design has been prepared as shown in the accompanying drawing and illustration. It is now available as a hardware item from several manufacturers. Experience with its use indicates that, with only a few exceptions, it will fit all transformers in the 2400-volt class, up to and including 25 kva. A check of several manufacturers' dimension records shows that it can, in general, be used for the whole group of sizes covered in the joint committee report, for 12-inch bolt spacing.

"A similar design has been made for transformers to be mounted on 24-inch bolt spacing. For the present, shop-built hangers are being assembled by welding old hanger-iron material to individually fit. These have 24-inch mounting bolt spacing, in line with the EEI-NEMA standard for larger transformers.

"It is apparent that no great percentage of investment or operating cost is involved in an individual decision between continuing customary cross-arm-hanger mounting and changing to direct-pole mounting. Here again, however, as in other decisions regarding distribution line practices, we should remember to multiply the small difference by the number of thousands of units involved.

"For the Cincinnati Gas and Electric Company distribution system, several considerations have led to a complete change to direct mounting, for all new and repaired transformers to be installed. For construction used in Cincinnati: the estimated unit saving for new transformers in new installations is $3.85 for the sizes 25 kva and below; for the older transformers, equipped with adapters in the repair shop, the saving for the crossarm and bolts will pay for the new hangers and the cost of changing them; for larger installations of new transformers, where we have in the past used channel reinforcement, the saving will be $8.50; and for the larger sizes with shop-built adapters, there is an average saving of about $4.00.

"The largest consideration cannot be directly evaluated. Last year, there were 187 distribution poles in the Cincinnati system hit by machines. The exact number of these poles that carried transformers is not recorded, but in 14 of these cases, outages at the transformer resulted. There are 10 or 12 transformers taken to the repair shop yearly that are included in the damage. Usually they stay in the air, in a precarious position, but some drop to the ground."

* * * *

Setting the stage at the AIEE winter convention in New York City for the Power Transmission and Distribution Committee's "Symposium on Distribution Systems in Wartime," Philip Sporn, of the American Gas and Electric Service Corporation, declared: "It is necessary to ascertain how far ideas that were perfectly sound only a short time ago are still sound today, and how far they can be modified; and to what extent new ideas can be used—particularly for the duration of the emergency, so as to reduce to the practical minimum the total efforts expended on expansion of distribution systems."

Data presented by L. R. Gaty, of the Philadelphia Electric Company, in his paper on "Underground Distribution Systems in Wartime," provides helpful hints on practical methods of cooling underground equipment.

"Improvement of vault ventilation and subway transformer cooling has been investigated by the Boston Edison Company," Mr. Gaty pointed out. "The maximum safe operating temperature is established as 100 degrees C at 100 per cent load, which results in a top oil temperature of approximately 80 degrees C. During the summer of 1938, the problem of excess temperature on subway transformers became critical and was temporarily solved by flooding the vaults with water from the city mains. This method of cooling was entirely satisfactory as an emergency expedient, but a more permanent method of correction was necessary.

"A fabricated steel grating was designed and used to replace the 4'2"x3'2" solid rectangular covers in the roof of the vault. This resulted in a reduction of 14 degrees in the manhole ambient temperature, although the differential between the top oil temperature and the manhole ambient temperature remained at 22 degrees C. A net capacity increase of 15 per cent resulted from the reduced manhole ambient temperature provided by the open grating.

"The transformer loading was so high that this reduction was insufficient to reduce the hot spot temperature to 100 degrees C. Experiments were then conducted with supplementary external radiators installed on the transformers. Two cast-iron radiators of 26 1/3 square feet and of rated radiation were used on a 100 kva, 3-phase cast-iron tank transformer. One of two such transformers in a vault with the open grating was equipped with these radiators and a ten-day heat run was made on each transformer. This resulted in an indicated increase in capacity of 21 per cent for the transformer equipped with radiators when installed in a vault with the ventilating grating."

Many helpful suggestions on the increased loading of existing facilities were described by Harold Cole, of the Detroit Edison Company, in his paper on "Overhead Distribution Systems in Wartime."

Three factors that make it possible to carry peak loads on transformers greatly in excess of the nameplate rating were pointed out by Mr. Cole. "First, the thermal capacity of the iron core, the insulating oil, and the tank absorb heat from the windings and greatly reduce the resulting temperature rise on short-time peaks. Second, the loads of highest peak values and longest duration usually occur in winter when ambient temperatures are low and the resulting temperature in the windings is correspondingly reduced. Third, the limiting temperatures assumed in the rating would only cause failure after continuous operation over a period of years."

Line-type voltage regulators or step-voltage boosters are one of the "very economical expedients available to improve the regulation of long rural circuits" that were cited by Mr. Cole. "These are now manufactured in a wide range of sizes and steps of voltage change. The simpler forms of step-voltage boosters are quite satisfactory for rural or suburban line regulation, and their use produces an improvement of voltage regulation which would require many times the amount of material in conductors to produce like results."

Mr. Cole suggested three expedients to conserve the use of conductor material. These are: replacement of the larger sizes of wire with smaller in locations

(*Continued on page 56*)

Industrial Wiring Practice

Part 5—An extension of voltage regulation considerations to three-phase systems, including a discussion of equivalent spacing and voltage to neutral.

By B. Z. Segall

ALL OF the discussions and calculations in this series, so far, have dealt with single phase circuits. In polyphase systems, the basic principles shown in the preceding articles are, of course, applicable to the solution of voltage problems. The actual manipulation of the calculations, however, are little more involved.

It will be remembered that in Part 3 it was stated that the reactance value per conductor for a 4/0 open wire feeder arranged for 4-inch spacing was the same for a two-wire single-phase system or for a symmetrical three-wire, three-phase circuit. Figure 12 shows an example of both systems. For the assumed 4/0 feeders, each conductor of either system has an inductive reactive value of .071 ohms per thousand feet. This is true as long as the equivalent conductor spacing of the polyphase system is equal to the spacing of the conductors of the single phase system.

The true evaluation of the inductive reactance is dependent on the determination of this equivalent spacing. For a condition where the conductors are arranged as shown in Figure 12, each wire is at the same distance from the other wires in the system. The conductors are equidistant from each other. As pointed out in the preliminary discussion of reactance, the inductive effect is dependent on the alternating current field produced around each conductor, by the current flowing within the conductor, cutting the other conductors of the circuit. If all conductors are equally spaced from each other, then the inductive reactance for each should be the same since the field conditions are the same for each conductor.

Suppose, however, that the three conductors were arranged as in Figure 13a. Now the distance between A and C is twice as great as it was in Figure 12 although the distance from A to B and B to C is still the same. The inductive reactance increases with increased spacing so that conductors A and C will have a greater reactive effect with respect to each other than will conductor B with respect to conductors A and C. The inductive reactance per conductor must be increased and to find the value of this increase the equivalent spacing factor must be found. The inductive reactance per conductor is then found on the basis of this increased equivalent spacing value. To illustrate, the spacing shown in Figure 13a will be used. The equivalent spacing is found from the formula: "Equivalent spacing equals cube root of the product of the three distances between conductors." In Figure 13a, the equivalent spacing is the cube root of the product of distance A to B, distance B to C and distance C to A. The cube root of 4 x 4 x 8 equals 5 inches, approximately, and this is the equivalent spacing to be used in voltage drop calculations. From reactance table, the reactance is found to be .076 ohms per 1,000 feet, or an increase of 7% over the value obtained for 4-inch spacing.

Using the above formula the equivalent spacing factor may be determined for some of the more commonly encountered arrangements. Thus for Figure 13a, using the ratio of the distances to one another, it is found that for symmetrical flat spacing, the equivalent spacing is equal to 1.26 times the distance between the middle conductor and either of the two outer conductors.

For the case shown in Figure 13b, the distance from A to C is equal to 5.65 inches and the equivalent spacing for conductors in this configuration is 1.12 times the distance A to B or B to C.

Thus, the reactance for each conductor would be based on a spacing of 4 x 1.12 or 4.48 inches. From a reactance table this will be about .073 ohms per 1,000 feet. This is less than the flat spacing value shown in Figure 13a and, of course, results from a closer spacing between conductors A and C, that is, 5.65 inches instead of 8 inches.

If the conductors are arranged in an irregular pattern, then the value of "S" as a factor must be definitely stated in terms of one

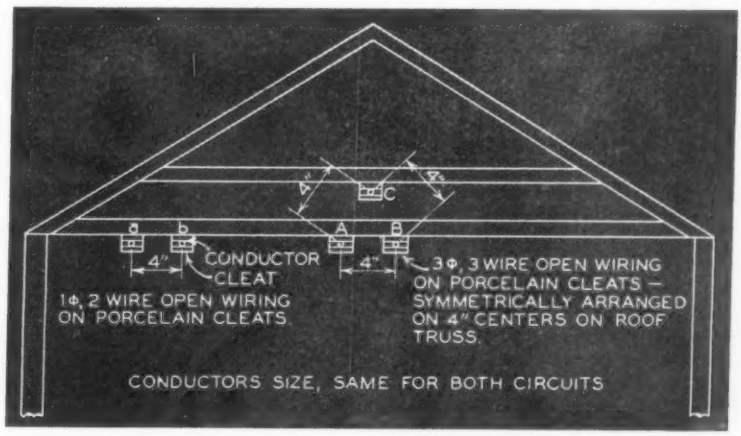


Fig. 12. Single-phase and three-phase systems having equal inductive reactance per conductor are illustrated in the diagram above.

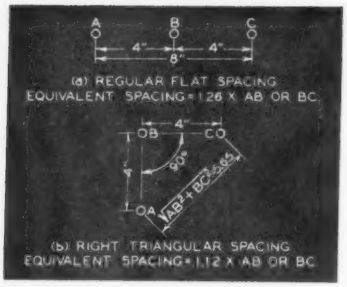


Fig. 13. The diagrams above illustrate regular flat spacing and right triangular spacing of conductors. The equivalent spacing factor is given below each diagram.

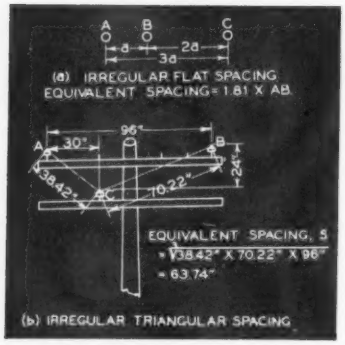


Fig. 14. Irregular spacing of conductors, encountered especially on pole lines, are illustrated in these two diagrams. The equivalent spacing factor for each arrangement is also shown.

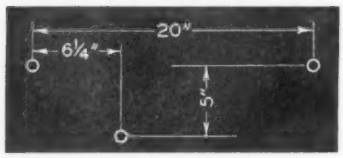


Fig. 15. The irregular triangular spacing shown in this diagram is equivalent to that of Fig. 14-B but has proportionately smaller distances between conductors.

distance or another. Thus for a condition such as shown in Figure 14a, where the distance from the two outside conductors is three times the distance between the left hand and the center wire and only 1½ times the space between the right hand and center wire, the value of "S," the equivalent spacing is the cube root of 1 x 2 x 3 which is found to be 1.81 times the smallest distance of the three. Thus if the distance AB is 4 inches, then BC is 8 inches and AC is 12 inches. The equivalent distance is based on the smallest distance, therefore the reactance per conductor must be based on a spacing of 4 x 1.81 = 7.24 inches. For a 4/0 wire, the reactance table shows this to be .085 ohms per 1,000 feet.

Figure 14b shows an irregular spacing for a triangular arrangement of conductors. This condition may be found when overhead lines are installed on cross arms. The equivalent spacing, "S," for this arrangement is the cube root of 38.42" x 70.22" x 96" = 63.74 inches or 5.31 feet. The reactance per conductor per 1,000 feet from the reactance table for 4/0 wire is .135 ohms. This is almost double the value of reactance for the symmetrical arrangement shown in Figure 12. The value of "S" for an arrangement of this kind should be based on the distance from A to B since this will, in all probability, always be some whole number. "S" will be found to be .66 times distance AB.

It should be pointed out that the determination of the ratio "S," rather than the actual value, facilitates the quick calculation of the equivalent spacing for similar patterns of conductor arrangement having proportionally larger or smaller distances between conductor. Thus in Figure 15, this spacing is the equivalent of that shown in Figure 14b and the equivalent spacing for determining the inductive reactance per conductor would be .66 x 20 = 13.2 inches.

After the reactance is determined, the next step is to relate it to the actual circuit voltage drop. In polyphase circuits all calculations are based on "the voltage to neutral." Thus for a hundred foot 4/0 feeder, arranged for a three-phase, 240-volt circuit as shown in Figure 12, the reactive drop per feeder would be 100 ft. x .071/1000 x 385 amps. = 2.73 volts. This is ½ the value shown for the single-phase circuit in the calculations shown in Part 3 (See March 1942 issue). In these single-phase calculations, both wires of the circuit were considered. This can be done for any single-phase circuit. In the polyphase calculations, only one conductor of the circuit is usually considered. On the same basis, the resistance drop of this circuit per conductor can be shown to be ½ of the value shown in Part 3, or 1.86 volts. The total impedance drop per conductor is also ½ the single-phase circuit value, or 3.15 volts.

The "voltage to neutral" for a 3-phase system is line to line voltage divided by 1.73, or 240/1.73 = 139 volts for the circuit in question. (See Figure 16.) For 100% power factor load, the supply "voltage to neutral" required to assure 139 volts at the equipment would be 140.88 volts. (See formula in April 1942 issue.) The actual line supply voltage required would be 1.73 x 140.88 = 243.73 volts. In other words, to assure a 240-volt load voltage on this three-phase circuit, it will be necessary to impress approximately 244 volts at the supply end of this feeder.

The "voltage to neutral" for a two-phase system is obtained by dividing the "line to line" voltage by 1.41. It should be noted that both the "four-wire" and "five-wire" two-phase systems may be handled as two separate single phase circuits. In this case the total drop in each phase line of each circuit is added to the load voltage to obtain supply voltage.

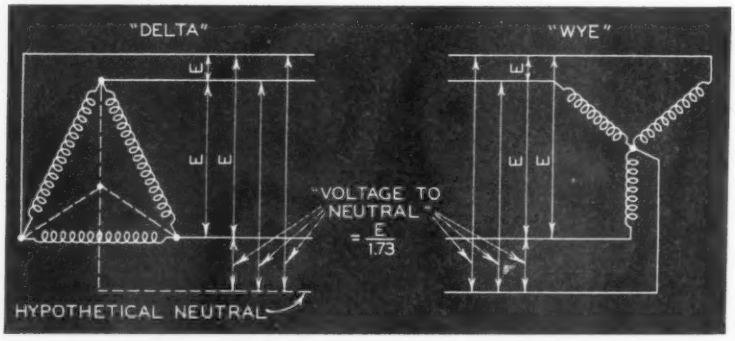


Fig. 16. The relation of "voltage to neutral" and line voltage for both Delta and Wye three-phase systems is shown above. In both types of systems, the voltage between phase conductors is 1.73 times the voltage to neutral.

Defend Your Business Security With Better Management

5. Inventory is Hub of Costing System

By Arthur Roberts

This is one of a series of articles which will discuss various phases of business management from the viewpoint of the electrical contractor and appliance dealer. The first article of the series appeared in the December 1941 issue of this publication.

Questions by readers relating to their specific problems in cost accounting, department records, etc. will be given prompt attention. Address such inquiries to the editors.

TODAY, with priorities, allocations, delays in shipments, price control, higher taxes, higher wages, the mounting danger of inflation and the uncertainties of war and post-war activities, it is settled that the electrical contractor who does not know his costs will get what Hitler got at Moscow.

Inasmuch as inventory is the hub around which a contractor's costing system revolves, it follows that he should inventory his methods of handling materials, supplies and equipment in order to assure adequate margins on sales that will cover over-all costs and net a profit. Today, the contractor must be super-sensitive to his costs—or else! And the place to start is with the inventory.

Much muddled thinking on the subject of inventory is due to the tendency to consider the subject in its entirety when it should be divided into two phases: (a) the valuation of inventory, and (b) the recording of inventory.

Both phases must be handled competently. Otherwise, the computation of net profit and net worth will be inaccurate, giving an erroneous slant on managerial fitness, inaccurate costs and a weak foundation upon which to budget future operations. This paper concerns only the methods of determining inventory value.

Eight Methods Available

The present emergency has complicated the problem because it has increased the usable methods, which now are eight in number. These are described in the following paragraphs.

(1) Cost only. The cost of materials, supplies and equipment as shown by purchase invoices.

(2) Cost or ceiling, whichever is lower. This method of inventory valuation is likely to appear on many financial statements until after the duration. It is a variation of the standard "cost or market, whichever is lower" method and will lead to the paradox of inventory losses, probably net losses on operation in a boom period, an almost unprecedented occurrence.

Under price control, there will be many inventoried items on which prices have been frozen. Inventory losses are likely to be experienced by those who bought materials or equipment ahead during the rising market prior to the establishment of controls.

Under priorities regulations hoarding is prohibited, a prohibition that has its good points because heavy inventories under price control may now beget big losses in that current value, by decree, may be fixed at lower levels than those at which the materials were purchased. Heavy inventories also mean idle capital for contractors with a normal slow turnover. Before price ceilings, a contractor could accumulate an inventory surplus without worrying about storage costs or interest on frozen investment because increased market values would offset the outlay, but this is now little comfort where price control halts an advance in value.

Of course, a contractor's position may be such that he need not worry about this condition but it is worth recording here because it shows that the subject of inventory requires detailed analysis and is more than merely adding up the value of stock on hand.

(3) The normal or base stock method. This assumes that a contractor must always have a normal or base stock on hand to remain in business and that this normal stock should be considered a fixed asset, the same as a working tool or business building, irrespective of price fluctuations in the market.

This method tries to establish some degree of control over inventory. Additions to base stock are usually priced at cost or average cost. When the base stock is reduced, the remainder is valued at the fixed price per unit, or proportionately to the volume remaining. Sometimes the depleted inventory is pro-rated so that when restored to its original volume, the original fixed value is likewise restored.

This method is not recognized by the Treasury Department for income tax purposes but it is used in costing, its users contending that it provides a better picture of costs, enabling them to budget future operations with greater accuracy.

(4) The last-in, first-out method, nicknamed "lifo." A modification of the normal stock method whereby the amount and value of inventory at the time the procedure is adopted becomes the normal stock. Current purchases of materials at higher prices are applied to current installations and current purchases of re-sale merchandise are applied to current sales. The older inventory remains untouched and continues to be valued on the same basis as the opening inventory valuation. Additions to it are also valued at the cost of the earliest purchases.

The practical application is to take care of price changes as they come along, to eliminate sharp peaks and valleys in earnings, to show operating results on the basis of managerial efficiency by removing the factor of fluctuating inventory price levels due to conditions beyond the control of the management. It reflects prof-

its when actually earned, thus tending to keep in proper relationships to realized earnings such expenditures as taxes, salaries, dividends and expansion outlays.

In short, the "lifo" method produces a higher cost of sales and therefore lower income in periods of rising prices. The reverse would be true if prices declined. Profits are shown as realized, not when they exist largely as book figures or as an increase in inventory value which may never be realized. The "lifo" method regards inventory at the beginning of a period as a fixed valuation and matches current purchases against current installation and sales costs. When items are drawn from the fixed inventory, it is held that these withdrawals are merely borrowed and must be replaced. The margin on current sales is restricted because purchases are costed at current quotations.

Lifo Method Not Recommended

Because the "lifo" method was permitted on income tax returns from 1938 on and has been frequently mentioned as a possible way out of inventory difficulties for the electrical contractor, many have asked us about it. Our studies of the subject convince us that it is not a desirable method for the electrical contractor and we advise deep consideration before adoption.

(5) First-in, first-out method. Using this valuation yardstick, the opposite of the last-in, last-out method, the first materials and goods bought are the first checked out of stock for installation or sales and it may produce inflated profits in boom times upon which taxes must be paid. Goods purchased last may be sold during the subsequent deflationary period and losses ensue.

(6) End-of-year valuation. Where there is an increase in inventory at the end of the year, the Internal Revenue Department permits three methods of valuation: (a) actual cost of materials and equipment recently purchased, (b) actual cost of purchases during the year in the order of acquisition, and (c) average cost based on year's purchases.

(7) Market price. This method concerns only securities valued at the open market and is used by cotton, grain and security dealers.

(8) Cost or market, whichever is lower. If current invoices indicate that goods can be replaced at lower values, these figures are used in the ending inventory. If the market prices rise, the stock on hand is not written up because that would be anticipating profits, a business misdemeanor. The contractor who anticipates profits by costing his inventory higher to meet market valuations, is building only paper profits and invariably we have found that this action leads to extravagant practices and expansion at a time when costs are high. This action also leads to excessive borrowings because, strange as it seems, our experience shows that electrical contractors borrow more money in boom times than in hard times.

This gives you a good general picture of the inventory methods in use today. "Well, which method is the most desirable for me?" asks the electrical contractor.

Our experience on contractor accounts and the research we have conducted in this field indicate that the wisest procedure is to use the "cost or market, whichever is lower" method of valuation. By so doing, you will not increase profits synthetically by means of inflated inventory valuation and this will minimize your difficulties and give you a more accurate view of profits and costs.

Although the contractor can control inventory quantities within his organization, economic forces beyond his control affect inventory prices. This condition in normal times offers hazards and today it is far more dangerous. When the price level at the close of a period is high, the contractor should cause his inventory to be priced at cost in the interest of conservatism. When markets are falling, a conservative management, which is always the wisest management, will see that inventory is evaluated to recognize the prevailing lower price levels and eliminate paper profits.

Inventory your inventory methods now if you want to insure your business stability for the duration and after you emerge from this emergency! Follow conservative lines in the handling of inventory; otherwise, your costs will be inaccurate and if you do not keep accurate costs from now on, you will find yourself in as tight a spot as the Japs when we begin to put the axe on the Axis!

Keeping Dealers In the Business

(Continued from page 13)

dealers to extend their own efforts substantially. In particular, refrigerator repairs, service on irons and lamps has risen.

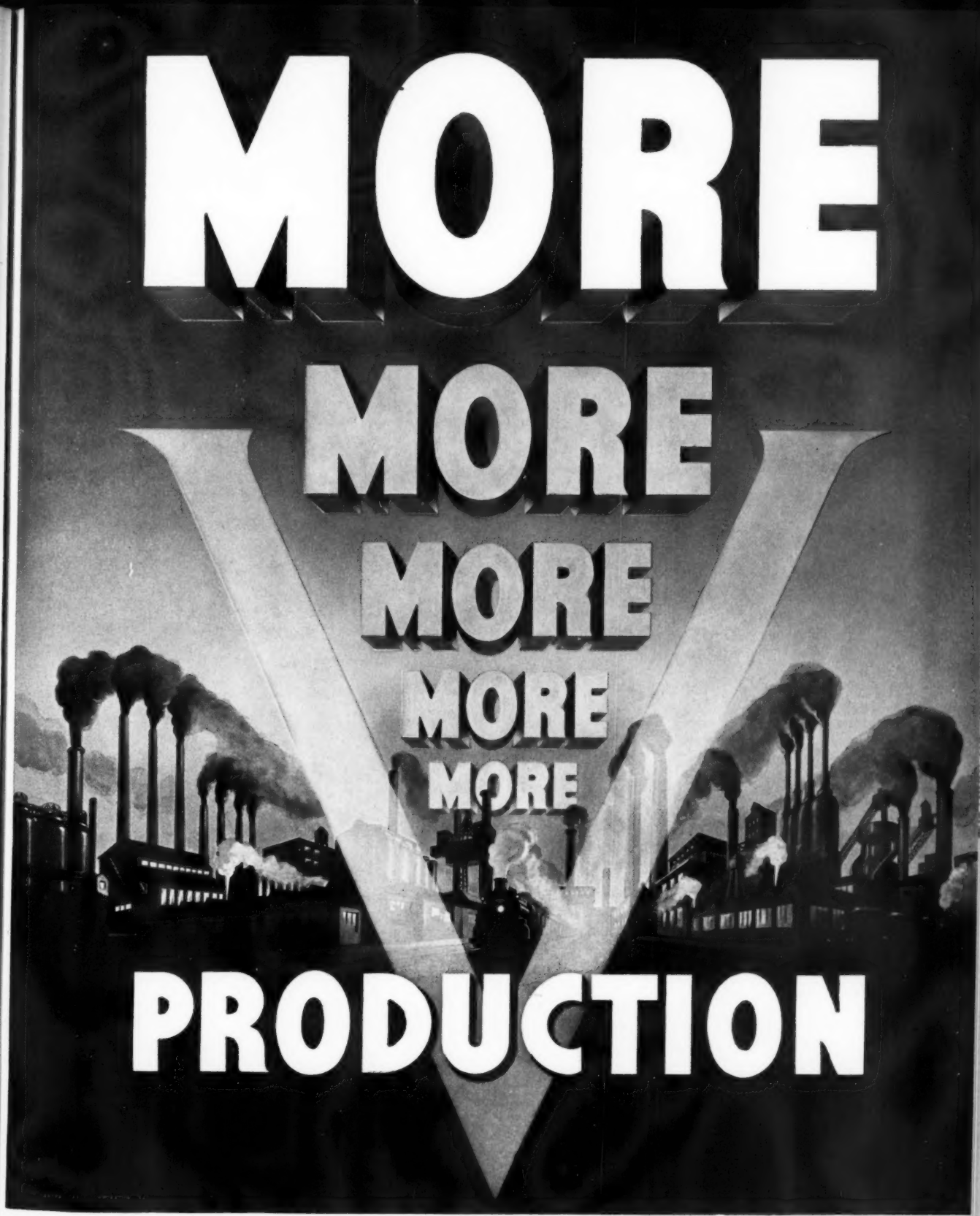
Observation of the progress of the program reveals that women almost without exception considered appliances no longer useful even when damage was quickly repairable. Hundreds of irons slated for the junk pile have been put back in service, scores of lamps, toasters and table appliances. Predominantly, irons, washing machines and refrigerator repairs are resulting.

How do dealers like the idea? Here are comments of a few chosen at random from the Certified list:

(1) Rudolph Jung, Freret Hardware Store—"We have gotten more appliance service business in three months of 1942 than all during 1941, and believe most of it came from women who learned about our service from the Public Service campaign. We are getting vacuum sweepers, irons and lamps for the most part, all profitable enough to make the enlarging of our service shop well worth while. I think it possible to make up for the lack of appliance sales altogether with a little larger volume of small appliance repairs."

(2) Jack Romain, Romain Appliance Service—"We are getting more service calls on large appliances, including refrigerators and washing machines, than we had expected to result. Our small appliance repair business has almost doubled, and we are receiving calls from customers who probably never knew we existed before. I'm in favor of the Certified plan as the easiest means of keeping up our business, and have been encouraged to add new equipment to take care of it."

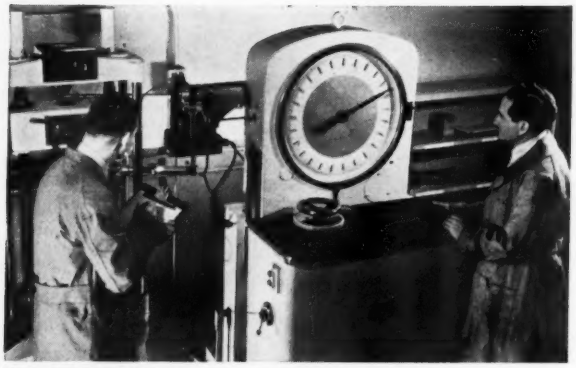
(3) Clarence Faiver, Calhoun Hardware Store — "We faced a considerable loss in our major and small appliance department when merchandise stopped coming through. More than that, we were losing customers who had bought appliances in the past, and would ordinarily come back for replacement. Now we have set up a good-sized repair shop, and can keep our name out in front of our customers by going after their repair business."



To every essential industry striving to aid the MORE PRODUCTION war effort, General Cable pledges all possible cooperation . . . in all ways.

GENERAL CABLE CORPORATION

HOTPOINT REPORTS



Research continues in Hotpoint laboratories. While factory works on war orders our research engineers continue with discoveries which will make Hotpoint Electric Appliances better than ever when production of appliances is again resumed for civilian use.

Hotpoint's New Movie *"Sauce for the Gander,"* tells the story of the electric home in an amusing and educational manner. This big-time picture is now being used extensively by retailers and utility companies as a good-will builder with the public.

Hotpoint Home Economists conduct classes in nutrition. Proper care of appliances is also taught. Thus Hotpoint not only aids in the government nutrition program but spreads more effectively the story of electric cooking and its contribution to better health.

Hotpoint Electric Ranges in defense homes demonstrate the economy of electric cooking. This is another feature of Hotpoint's war effort now being featured in our national magazine advertising. This helps to build a bigger market for the future.

Hotpoint Continues to Advertise. More effective than ever is the story our advertising is able to tell about electric cooking and refrigeration. The Army, Navy and War Industry Plants use Hotpoint. Safety, cleanliness, speed and economy are the features emphasized. Hotpoint's new book, "How to Conserve with Hotpoint Appliances" is featured in our advertising.

Edison General Electric Appliance Co., Inc.
5614 West Taylor Street, Chicago, Illinois

Thoughts at a Glance

America is rapidly learning that manufacturers with the best peacetime record for ingenuity in production are those who can best produce for war. The commercial importance of efficiency now gives way to the job of producing faster, cheaper, better than our enemies. In this, America is bound to win.

It is only logical that the government should entrust the most important jobs of producing the tools of war to the manufacturers with the best peacetime records.

It is a source of pride to Hotpoint that our reputation as a top ranking manufacturer won for us the additional recognition of large and important war production jobs. Doing these jobs further advances our capacity and ability for making good appliances, just as our record for peacetime efficiency prepared us for the more vital job of war production.

W. H. Turnbull
Vice-President

Hotpoint **ELECTRIC KITCHEN APPLIANCES**

RANGES • REFRIGERATORS • WATER HEATERS
WASHERS • IRONERS • DISHWASHERS • DISPOSALLS
ELECTRASINK • STEEL KITCHEN CABINETS

PRACTICAL HELPS for the TRADE

Contractor - Dealer - Motor Shop

Assembly-Line Method For Defense Houses

By the use of assembly-line methods, the Miami Beach Electrical Company, of Miami, Fla., recently completed the electrical installations for an "emergency housing" job well within the contract time-specification.

In order to speed up the work on this project, which covered an area equivalent to four city blocks, H. G. Millican, the firm's field supervisor, made up into separate "kits" the items necessary for roughing in and for trimming. The materials were delivered directly by the wholesalers to the company's store-house on the job. Here, Millican packaged the proper items in the exact amounts required for each construction unit, which consisted of two 4-room apartments.

For example, a trimming kit for one of these units contained eight fixtures, 20 duplex receptacles, eight receptacle-and-switch combinations, four single-pole switches with plates and two four-circuit panels. Obviously, electricians lost no time in procuring needed materials. And just as obviously, no materials accidentally could be left on the job.

Having the correct items at his elbow, one man trimmed two and one-half units per day.

Using a light pickup truck for making his deliveries, Millican kept materials going to his electricians just ahead of their needs, and, at the same time, kept in almost constant touch with work-progress. By this system of job supply and supervision, Miami Beach Electric reduced to a minimum the lost motion and the nerve-frazzle attendant on a job which doesn't move smoothly. The company's principals are O. V. Scott and T. E. Stadig.

H. G. Millican, field supervisor, Miami Beach Electric Co., Miami, Fla., prepares a trimming kit for "assembly line" wiring.

Eight Suggestions On War-Time Selling

These are challenging times for salesmanship and the conditions salesmen encounter must be met intelligently and constructively, reports "The Electrical Merchandiser," Dallas Power and Light Co. publication for electrical dealers, which offers eight points summarizing the many things dealers and their salesmen can do to keep their businesses on an even keel and to foster customer goodwill during this emergency period. The eight points are as follows:

(1) Be Realistic About War-time Conditions. Face the fact squarely that business as usual has become impossible under the steadily increasing demands of our National War Program. Grim decisions are being made which will affect every possible business and income fundamentally. Realize that scarcity of certain vital materials is making it impossible to fill the complete requirements of many valued customers.

(2) Adjust Your Viewpoint. Act now to build goodwill. Don't just blame all your troubles on priorities or the manufacturer and let it go at that. Take active, constructive steps now to maintain customer goodwill in spite of conditions. In these days when deliveries are slow and orders sometimes cannot be accepted and filled, it becomes more important than ever to maintain the goodwill of customers.

(3) Tell Customers Plainly Why Deliveries Are Slow. Explain thoroughly that priorities and mandatory delivery schedules may make deliveries on non-defense merchandise even slower than anticipated. Patriotism and patience will be required of all.

(4) Render Some Service Even If the Order Can't Be Taken. Always attempt to render some service to the customer on every call, particularly when it seems inadvisable to accept the order. When dealing with such customers try to (1) recommend acceptable alternates where possible, (2) offer suggestions or information for solving the customer's problems, (3) impress the customer with your desire to be of service even when there is nothing you can do immediately, (4) stimulate a desire on the part of the customer to buy from you when conditions return to normalcy.

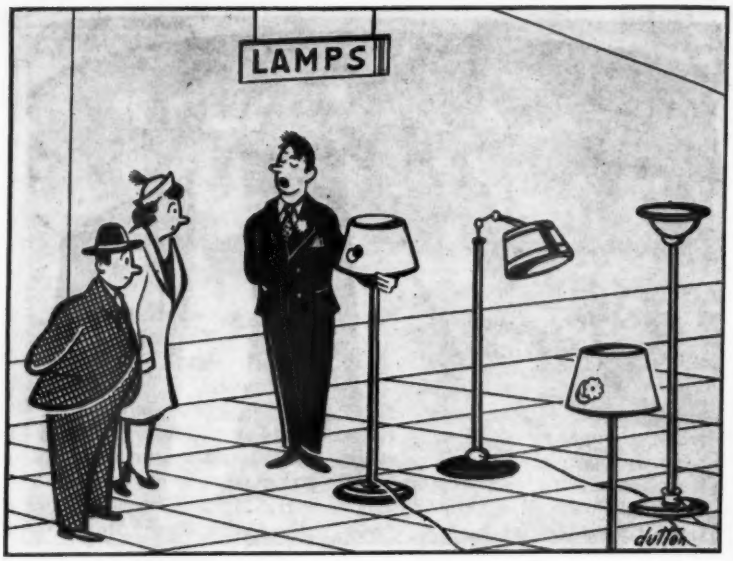
(5) Continue Selling the Benefits of Better Lighting. Keep prospects sold on the need for better lighting. Offer to make a survey and present a detailed lighting layout which can be studied now and authorization secured to make the installation as soon as materials become available. Present conditions offer an unparalleled opportunity to do the preliminary selling of the need for and benefits of better lighting—selling which is often neglected in other times.

(6) Show How to Improve Lighting from Present System. To those customers for whom you are

unable to secure delivery of new lighting equipment at this time, suggest ways of improving results from the present system: (1) recommend painting of walls and ceilings, (2) recommend more frequent cleaning of lighting fixtures, (3) recommend replacement of burned-out lamps and filling of empty sockets, (4) recommend renewal of over-age, blackened lamps, (5) recommend the use of lamps of proper voltage to assure maximum light for current consumed, (6) recommend a check-up of reflectors to make sure proper size lamps are used.

(7) Act As a Buying Consultant on Sources of Supply. Now that purchasing problems, especially in the Commercial and Industrial fields, threaten to become so critical, retain customer goodwill on all fronts, by offering your services as a buying consultant on the equipment and supplies you handle.

(8) Convince Customers That Others Get No More Than They. Demands of war come first, then essential civilian needs. Others usually can do no more for your customers than you. Cite examples and case histories from your experience to convince customers that others are experiencing the same delays and difficulties.



"And it's a fine lamp for blackouts . . . you just push this little button and the light goes out!"

Tester Simplifies Radio Service

A sensational new piece of radio test equipment, which will prove a boon to radio service men facing their busiest year in history, has just been announced by Philco, according to Charles E. Gerhard, manager of Philco's Parts Sales Division.

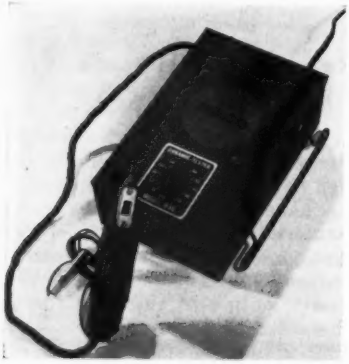
Known as the Model 030 Philco Dynamic Tester, this amazing Philco development will save the serviceman much valuable time on any type of radio repair job.

The 030 tester, which locates trouble quickly and accurately in any kind of a radio circuit, utilizes an extremely simple process never before used in any other kind of test equipment and is simple and easy to operate.

There are no confusing meters or indicating devices of any kind. It is small, light, portable and compact and can be placed anywhere in the serviceman's shop ready for immediate portability on outside jobs.

To operate the new Philco 030 tester, all the serviceman need do is to plug in on AC current. The ground wire is clipped to the chassis and a touch of the test prod indicates where a signal should be present. When a normal signal is not received at some particular amplifier stage, the test prod is touched to adjacent parts of the circuit and the exact spot of the trouble is easily and simply located.

In addition, the 030 tester instantly amplifies and reproduces through its own loud speaker, any kind of signal from any part of the circuit — R. F., I. F., A. F., and even short wave; traces the course of a signal through the radio and shows exactly where the signal is obstructed; quickly indicates gain in any stage of any amplifier tube, checks tracking of R. F. tuning with respect to dial calibration; tests phase inverter stage for equality of audio input to push pull output tubes; locates hum in condenser-resistor filter circuits, locates open screen grid and AVC bypass condensers; locates defective parts which cause noisy operation; tests phonograph pick-ups, crystal microphones or any device which generates a signal or noise of any kind. The tester weighs only 5 3/4 lbs, is 8 1/4" x 5 ¼" x 3" and lists for only $19.95.



The new Dynamic Tester, an amazing development that greatly simplifies the location of trouble in any kind of radio circuit.

Premiums Bring Tips on Appliances Available

An extremely practical premium promotion, whereby P. S. Barnes, president of Memphis Appliance Company, Memphis, Tennessee, expects to obtain used refrigerators, ranges, and washing machines, in the future, involves the gift of 32-piece dinnerware sets to customers in return for the names of homeowners willing to sell their used equipment.

The Memphis firm, located at 1690 Madison Avenue, with a "drive-in" show room allowing customers to park their automobiles and walk into the store exactly as if shopping for foods in super markets, built most of its 400-refrigerator-a-year sales volume on

premiums in the past. It might seem unreasonable to trace the sale of at least 200 refrigerators a year to a simple display of dishes sitting in the front window of the store—but according to Mr. Barnes, it's a fact.

Under the old system, Memphis Appliance Company gave a full 32 piece set of china or glassware (or refrigerator glass ware for cold drinks, etc.) to any customer furnishing the name of a new prospect who could be sold within 30 to 60 days. A card was kept in the window informing passersby that Mr. Barnes wauld be glad to send any of the premium items out to an informant's home as soon as the prospect furnished had been sold. Salesmen made a point during each appliance sale of explaining this plan to their customer, and thus got hundreds of housewives talking about it at once.

"We split the cost of each premium with the salesman," Mr. Barnes said, "Thus preventing them from becoming too liberal with the idea. In 1939, and 1940, we gave away 200 sets a year, at an approximate cost of $2.40 per sale to the store. We found that women proud of their kitchens, when told about the premium offer, could always supply the names of two or three of her friends who might be sold, and were interested enough to that if we couldn't sell the first group, they would go out and dig up several more—until they had won the dinnerware. The premiums cost us close to $1000 a year—but they brought in almost three times the busiess we had done before."

Of course, manufacturing curtailment and the freezing of domestic refrigerators knocked a big hole in this plan. Last August, Mr. Barnes discontinued the premium idea altogether, feeling that it was no longer necessary to "buy prospects."

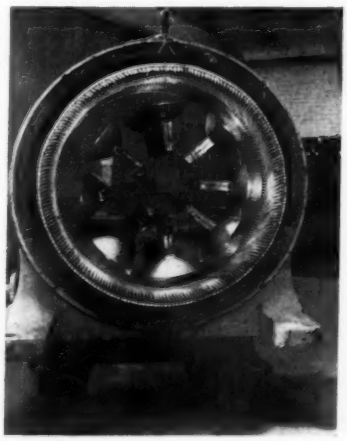
Now, since the beginning of the war, Mr. Barnes has found that his premium idea will work equally well the other way—the locating of sources of used refrigerators, ranges, washing machines, water heaters, etc., in which Memphis Appliance Company will deal "for the duration." To meet the shortage, Mr. Barnes decided last November that he was going to sell trade-ins, and to obtain as many of them as possible on the open market.

A large reconditioning shop equipped with facilities for overhauling electric motors, refinishing refrigerating systems, painting cabinets, rewiring, etc., was built for the purpose. There has been no trouble in making a difficult job to obtain enough used appliances for the purpose.

Now, Mr. Barnes has put the premium display back in the window. During the first month, more than fifty women called in to inform Mr. Barnes that "a lady down the street has two old washing machines in the basement," or "My aunt has a refrigerator out in the garage which she has intended to fix up, but never has," etc. Actually, enough used appliances were obtained by a little more than a month of intensive promotion to keep the shop operating at peak efficiency. The premium dispensed in this way are going a long way towards keeping the Memphis dealer supplied with the trade-in merchandise which he will have to have to operate "as usual" under war conditions.

Infra-Red Heat Units Designed for Motor Work

That radiant energy can be effectively used in electric motor repair work has been proven conclusively by many successful installations. Drying of water-soaked motors is easy with near infra-red; preheating of motor parts, coils, etc., is a matter of only a few minutes when radiant energy is used. Insulating varnishes can be baked faster and better with heat lamps, because the baking is from the inside out. Recent records show that a 3 hp stator can be baked in one hour and 45 minutes, and No. 801 G.E. coils also in one hour and 45 minutes.



One of the infra-red radiant heating units especially designed for motor drying and baking. Eight groups of four lamps each are arranged in a circle and may be placed directly within the stator. Advantages are much shorter baking time and the elimination of oven walls, etc.

The Fostoria Pressed Steel Corporation, Fostoria, Ohio, now has made available two motor-baking units to accommodate the needs of various size motor shops.

One of the two new models has 32 reflectors mounted on the flexible arm frame and will accommodate up to 37" in diameter. The unit comes completely wired. Using 250 watt lamps, the total load is 8 kilowatts. The other unit uses 16 reflectors and each arm is wired separately plugging into a common junction box, making possible the use of any combination of the reflectors. The total load of this unit is 4 kw. Motor and armature jobs that are too large to permit easy moving can easily be taken care of by flexible equipment taken directly to the job.

Telephone Surveys Bring in Appliances

A practical means of obtaining used appliances which can be reconditioned and put back on the market by appliance dealers makes full use of the telephone, according to Rhodes Danehower, president of Gas Refrigerator Corp., gas and electrical appliance dealership, of New Orleans, Louisiana.

Finding that he could not depend upon salesmens' availability under war conditions, Danehower has put all selling and contact work of the store on a telephone basis. He is now "cold canvassing" the market by telephone not for sales of new appliances, but primarily to uncover prospects willing to sell used refrigerators, ranges, washing machines, etc., which can be quickly reconditioned and resold. "We lost twelve salesmen in five months because of the lure of high-pay defense jobs," Mr. Danehower explains, "so it was either use the telephone or go out of business. Now, after six months of operating on this basis, we find that we have actually sold more new appliances this way than we did when we had four or five salesmen out ringing door-bells and following up store leads."

Formerly, Danehower used the telephone to uncover prospects. Now, its use has gone sharply the other way—and he is himself the customer. "We are calling each house in a fifteen-block sector of the city in about two days' time," he explains, "and moving on to another fifteen-block area as soon as we finish with the last. In each case, we tell whoever answers the phone that we are making a refrigerator survey and ask for the name, age, and condition of whatever refrigerator the customer is using. If the box is more than five years old, and the person called tells us that it has been giving her trouble of some kind, we consider her worth following up. Where the refrigerator is even older, we go out at once."

Two salesmen who stayed with the store are thus spending about 50% of their time buying instead of selling appliances.

If the telephone conversation indicates that the customer is tired of paying for service on the refrigerator, Mr. Danehower asks while on the telephone if she would consider selling it. Quite a few immediate purchases have been made in this way. For the most part, however, it has been found just as good to go out and personally examine the refrigerator.

In a little less than a month, the store got ten refrigerators, fourteen washing machines and two gas ranges in this way. During the next month there were only five washing machines, but eleven old refrigerators. Allowances made are according to the future selling price. Mr. Danehower figures what the box will sell for, how much it will cost to recondition it, allow himself a profit and pays the difference for the box. Since he now has many customers on a "waiting list" it isn't difficult to make slightly larger allowances, and the store has been able to buy many more without gambling.

Wiring Time Savers For the Contractor

In electrical contracting—as in other lines of business—time, more than ever, now "is of the essence." Having wired over 1,000 low-priced homes for a single sub-division developer during the past few years, Tropical Electric Service, of Miami, Fla., has become adept in finding legitimate ways to turn out more work in considerably less time.

J. G. Sutherland, Tropical Electric Service, Miami, Fla., lops off 10% of joist-boring time with high-speed machine.

"Here is a gadget," asserts John G. Sutherland, the firm's senior partner, "which over a 10-year period has earned in saved-time at least 10,000% on our original investment." The device referred to is a strap-and-spring operated boring machine. In addition to its great speed, it has several other advantages.

Adjustable to any required length from 3½ to 14 feet, this machine is especially useful for boring holes in joists. It will bore at a 90-degree angle, making it much easier to pull through sheathed cable or to insert steel tubing.

The border's pull-strap is made of webbing. Therefore, the machine is convenient to operate and the avoidance of barked knuckles is not the least of its virtues.

Wherever specifications or local codes require that sheathed cable or steel tubing be passed through joists, employment of this type of borer will lop off no less than 10% of the time necessary for a house-wiring job. For this reason, Sutherland expresses his surprise that he has seen so few of these machines in use.

Electrical contractors who never have used it may find helpful another of Mr. Sutherland's "time saver" ideas. With a hammer, he spread the jaws of a stadard, hand-operated 1-inch tube-bender to take 1-inch conduit which has approximately 5/32″ larger outside diameter. Tropical Electric buys straight conduit and bends needed lengths as required.

In handling a wiring contract on a group of houses built to a standardized floor-plan, Mr. Sutherland says that by pre-cutting and pre-threading pipe, three men can put in a panel and connect in the "service" in 15 minutes.

These sub-divisions comprised anywhere from 100 to 300 houses, each of which had an average of 25 outlets. By the methods described, and by the use of a portable electric drill, one man and a helper roughed in and trimmed a 5-room house in 10 hours.

Associated in Tropical Electric Service with Mr. Sutherland is his partner, E. C. Pinder, Sr.

Questions on the Code

21. Question: Is it necessary to ground frames of fixed equipment if operating at less than 150-volts to ground?

Answer: Yes, if covered by Sections 4436 or 5111.

22. Question: Is a rubber sheathing lampholder considered molded composition, etc., as required in Section 5108?

Answer: Yes.

23. Question: (a) Must a Number 4 grounding conductor be protected if run open? (b) Must a Number 6 grounding conductor be protected if stapled to wall?

Answer (a) Yes, if subject to severe mechanical injury. (b) Yes, if subject to mechanical injury.

24. Question: Are soldered lugs approved for use on ground clamps.

Answer: No.

25. Question: What is the largest copper grounding conductor required?

Answer: A 3/0, if connected to other than artificial electrode; a Number 6, if connected to an artificial electrode. (See Section 2594.)

26. Question: Why is a 1-inch pipe specified instead of a 3/0 wire in the Code table on page 77?

Answer: This is for use in grounding metallic enclosure systems only, and not for neutral service grounds.

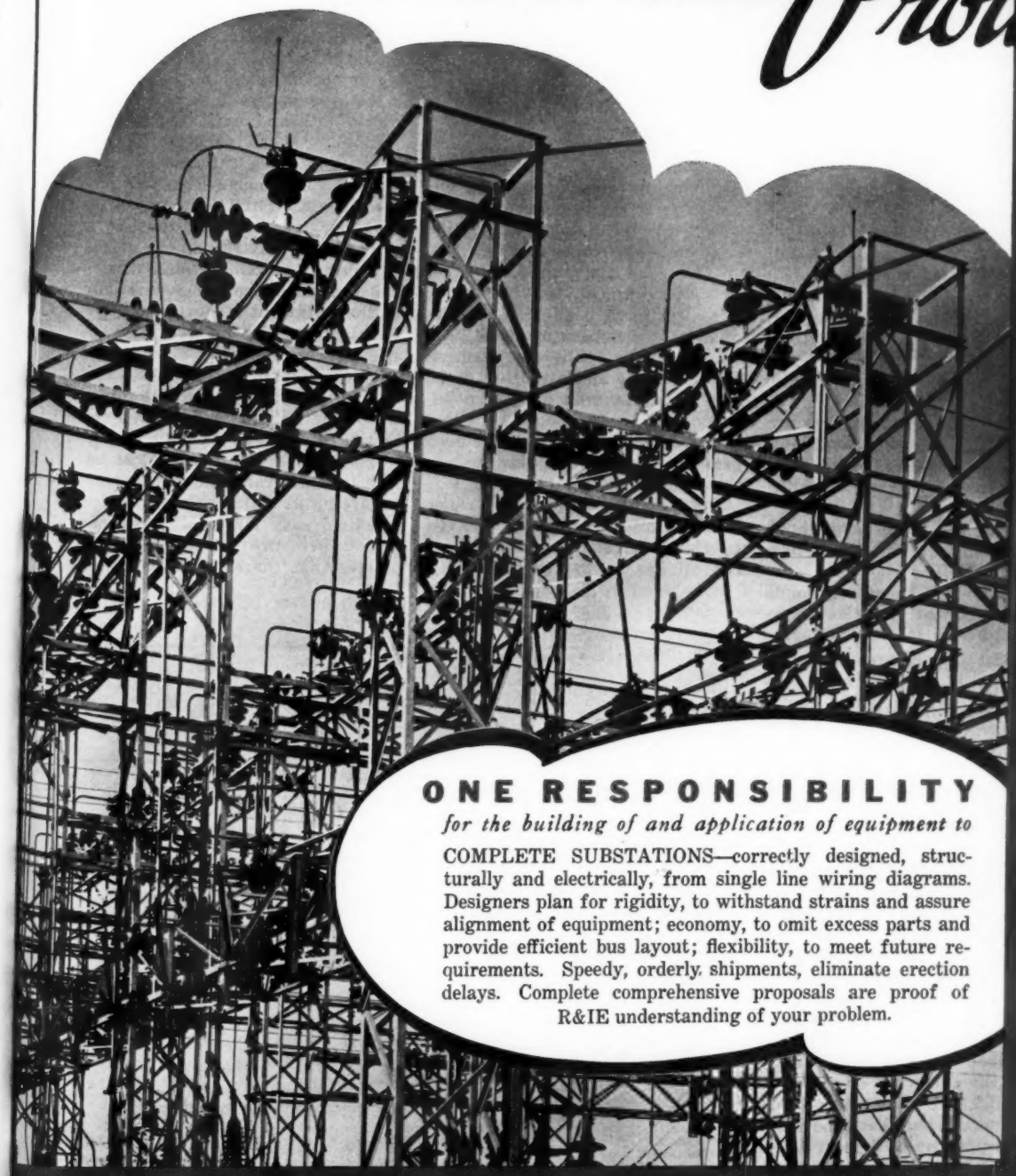
27. Question: What is the smallest size copper conductor permitted for grounding the secondary neutral conductor?

Answer: No. 8.

28. Question: What is the smallest size of conductor permitted for equipment ground?

Answer: No. 14.

CHECK THE FACTS on R&IE Products



ONE RESPONSIBILITY

for the building of and application of equipment to

COMPLETE SUBSTATIONS—correctly designed, structurally and electrically, from single line wiring diagrams. Designers plan for rigidity, to withstand strains and assure alignment of equipment; economy, to omit excess parts and provide efficient bus layout; flexibility, to meet future requirements. Speedy, orderly shipments, eliminate erection delays. Complete comprehensive proposals are proof of R&IE understanding of your problem.

ENGINEERING AND PRODUCTION

COMPLETE SUBSTATION

OPERATING MECHANISMS

AIR BREAK SWITCHES

BUS CLAMPS

CONNECTORS

DISCONNECTING SWITCHES

CUTOUTS

THERMO-RUPTERS

METAL HOUSED, SEGREGATED BUS

AUTOMATIC THROW-OVER EQUIPMENT

METAL CUBICLES

INTERLOCKS

TESTING DEVICES

RAILWAY AND INDUSTRIAL ENGINEERING CO.

GREENSBURG, PA. . . . . IN CANADA, Eastern Power Devices, Ltd., Toronto

INDUSTRIAL ELECTRIFICATION
Installation and Maintenance

Electrical Maintenance Essential to Production

Responsibility for keeping industry geared to the tremendous task of producing the equipment required for winning this highly mechanized war rests on the maintenance engineer, C. W. Fick, General Electric engineer in charge of the East Central District, emphasized in a recent address before the Cincinnati Electrical Maintenance Engineers Association. Mr. Fick pointed out that the maintenance engineer's job may be divided into three main parts:

1. To prevent interruptions or outages which may be caused by accidents to or failures of the electrical service or electrical equipment in the plant.

2. To keep the duration of those interruptions which do occur to a minimum.

3. To plan for increased loads and extensions of electrical service.

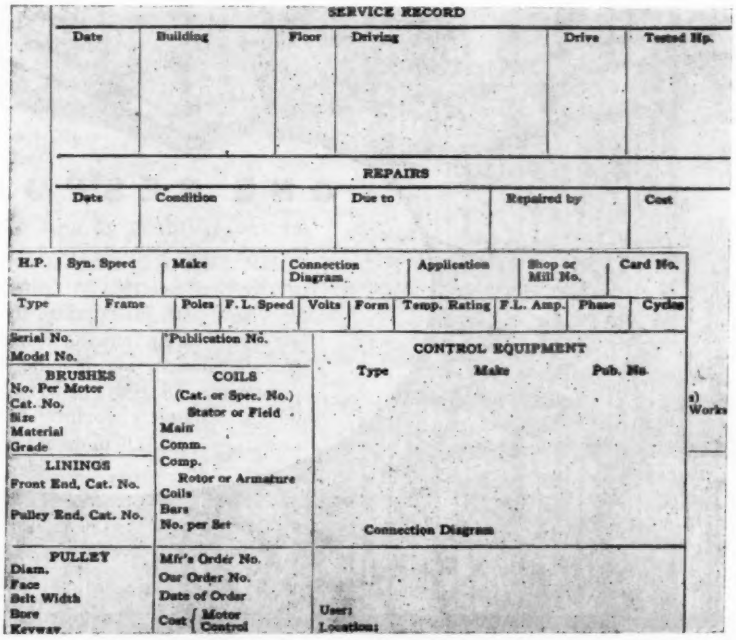
The first step in preventing interruptions is to keep an up-to-date list of all electrical equipment in the plant. This should account for every motor, control box, transformer, circuit breaker, as well as electric cables, in terms of size and rated capacity. Next, a regular schedule of inspection must be set up so that the load carried by the electrical apparatus, as well as the condition of the apparatus, is known. If nothing is done until failures actually occur, they will begin popping all around. Production managers are calling for increased output on each machine. If the maintenance engineer knows what that means in the load on his electrical apparatus, he can work closely with the production manager or with the foreman to see that production is not stepped up to a point where a failure of the electrical apparatus will surely occur.

It should not be necessary for motors to squeal for lack of oil, or smoke from overload, before their condition is checked to see what can be done about it. The oil in transformers and oil circuit breakers is expected to serve as an insulating, cooling, or arc-quenching medium. However, oil can deteriorate gradually with the result that these characteristics are impaired. Breakdown of equipment has more than once been due to the fact that the dielectric strength of the oil was not what it should have been, or that the oil level was not maintained. Such accidents are really a reflection upon the care and attention given by the maintenance man. Not always, but sometimes. In those cases the accident could have been prevented by the regular inspection schedule.

Transformer supervisors occasionally find an ancient or heavily overloaded transformer in which the oil has congealed to a jelly-like mass. Obviously, in that condition the oil cannot do the job expected of it, either as an insulating or cooling medium.

Motor bearings fail because of lack of oil, and with the heavier and higher speed machines, the results of bearing failures can extend beyond merely bearing replacements. Sufficient heat may be generated to spring the shaft, or the rotor may rub on the stator damaging the laminations with a consequent expensive repair job. In these times it is more than ever necessary to prevent bearing failures because of the scarcity of bearing materials. Copper, tin, and antimony, which go into the make-up of the babbitt, are now on the critical list.

Improper brush pressure can result in flashovers of commutators, or arcing at collector rings. It is such an easy matter to keep the brush pressure at recommended values that there is really no ex-



SERVICE RECORD

Date	Building	Floor	Driving	Drive	Tested Hp.

REPAIRS

Date	Condition	Due to	Repaired by	Cost

H.P.	Syn. Speed	Make	Connection Diagram	Application	Shop or Mill No.	Card No.

Type	Frame	Poles	F. L. Speed	Volts	Form	Temp. Rating	F.L. Amp.	Phase	Cycles

Serial No.
Model No.
Publication No.

CONTROL EQUIPMENT
Type Make Pub. No.

BRUSHES
No. Per Motor
Cat. No.
Size
Material
Grade

COILS
(Cat. or Spec. No.)
Stator or Field
Main
Comm.
Comp.
Rotor or Armature
Coils
Bars
No. per Set

LININGS
Front End, Cat. No.
Pulley End, Cat. No.

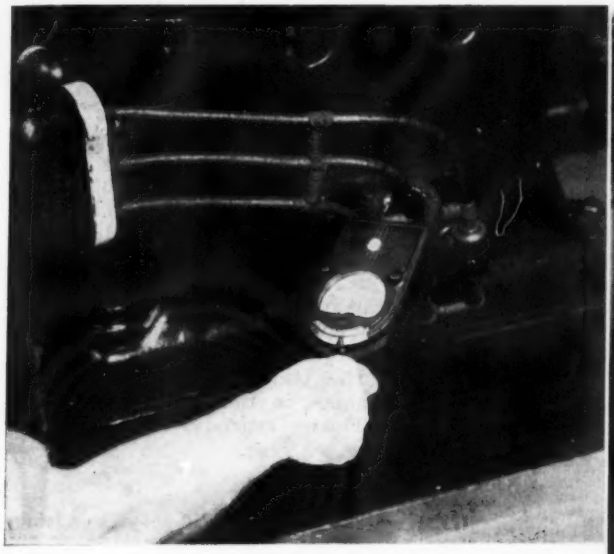
Connection Diagram

PULLEY
Diam.
Face
Belt Width
Bore
Keyway

Mfr's Order No.
Our Order No.
Date of Order
Cost { Motor / Control

User:
Location:

Two sides of suggested form for recording motor service record.



Right, clip-on type ammeters are useful in checking motor loads to prevent overloading. At left, close-up view of pointer - stop ammeter in use.

cuse for troubles of that sort.

In many plants the wire and cable are being called upon to carry excessive loads. The cables themselves may not show distress, but they may have been figured for a certain voltage drop at normal currents, and when those currents are greatly exceeded the voltage delivered to the motor or to the apparatus may not be sufficient to permit that machine to do its job properly. A 10 per cent voltage drop results in a 19 per cent loss of torque in an induction motor. That actually means a decrease in the production of the machine driven by that motor, and today we are looking for increased, not decreased, production.

Keeping Outages to a Minimum

The wise maintenance engineer plans on some failures occurring even though he takes every precaution to prevent them. Experience and a careful check on loadings will generally indicate possible danger points. The best procedure is to (1) have spare parts available; (2) if possible have a spare machine ready to install in place of the one that fails; and (3) know where each type of apparatus can be repaired most reliably and quickly, so that in case of failure, no time will be lost in locating a suitable repair shop. This is good information to have on the card record of each machine.

Where a new machine is to be added it is often possible to simply extend an existing cable run without overloading the cable or causing excessive voltage drop. This should be done intelligently, of course, knowing both the capacity of the cable and the load it will be called upon to carry.

Major plant extensions, on the other hand, will require entirely new feeders, and in such cases it is suggested that specialists be consulted. Incorrect methods of supplying power to new plants and to plant extensions cost excessively and waste materials. Studies have been made which prove that the load-center distribution method of supplying power offers many advantages. In this method a factory-built unit substation is installed at the load center and fed by high-voltage cable, in contrast with the older method of bringing the high-voltage cable to an outdoor substation and then having long runs of low-voltage cable. The unit substation method permits the use of smaller transformers, which in turn permit the use of smaller rupturing capacity breakers, and it keeps the length of runs of heavy, low-voltage cable to a minimum. Time is saved in the installation of such a distribution system, and frequently the cost is reduced by 20 per cent.

To sum up, the maintenance engineer's job is, first, to know at all times the condition of his apparatus; second, to know the loads the apparatus must carry; and third, correct the weak points before they fail. Doing a good maintenance job can contribute directly to the war effort.

"Slide Rule" Shows Proper Motor and Motor Control

A pocket size "slide rule" selector for electricians, plant maintenance men and others interested in the selection of electric drive equipment has recently been announced by Westinghouse Electric and Manufacturing Company.

To guide in the selection of the proper type of motor for each of 44 industrial applications, a convenient table lists the various uses and indicates which of the four principle types of a-c motor should be selected. The specifications, performance ratings and control classes for the required type is readily determined by making the corresponding setting on the slide.

Information is obtained from the selector by setting the cardboard slide for the proper motor type and then reading its specifications through the window in the acetate envelope. Pertinent facts such as horsepower ratings,

This motor and motor control selector slide rule for electricians, plant maintenance men, and others interested in the application of motor and control equipment, will save considerable time in determining specifications, performance ratings, and control classes for industrial applications.

speeds, voltages, frequencies, and starting and pullout torques are thus secured. The reverse side of the selector shows which of the various magnetic and manual controls are available for each type of motor and lists the proper control number.

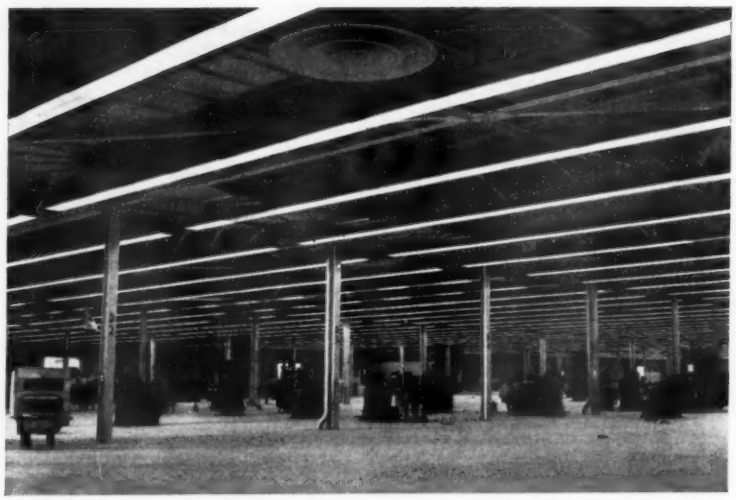
This motor and control Electric Drive Selector, SA-714, can be obtained from Westinghouse district offices and distributors.

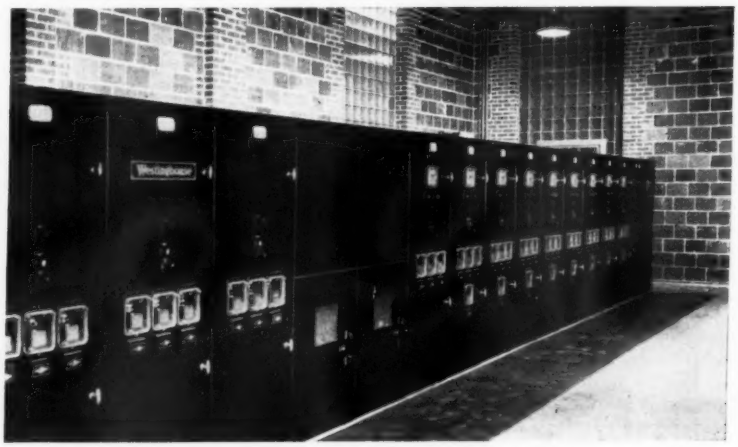
Southern Ordnance Plant Has Three Miles of Lamps

Nearly three miles of fluorescent lighting was provided for the "blackout" machine shop of this $7,000,000 Ordnance Plant, recently put into production by the War Department in a Southern city. The machine shop, 300 by 500 feet in size, has no windows or skylights, and therefore requires constant lighting during working hours, as well as complete year-around air conditioning. The latter is provided by means of a 1,200 ton system in 12 separate units, so that if one is knocked out the others will be unaffected. Winter heating is provided by means of gas-fired boilers which, with compressors and other air conditioning equipment, are placed in a half dozen pent houses, equally spaced on the flat built-up roof.

Power and light for the plant, which consists of some 23 different buildings, is supplied through a 44,000-volt, double-circuit line to a 7,500-kva, 44,000-2,400/4,160 volt, delta-wye transformer bank. From this sub-station there is underground service to the main switchboard building consisting of four circuits of three 750,000 cir mil 5,000-volt cables each. These circuits are installed in a duct bank consisting of eight 4½-inch fiber ducts, encased in concrete, a minimum of 6 feet below ground level.

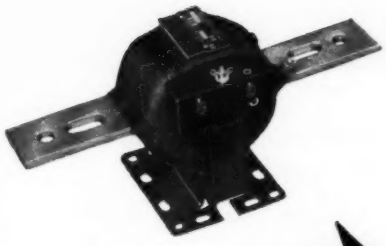
Spare ducts are provided for any future addition of feeder cables. The underground service terminates at the main switchboard which consists of metal-clad switch gear.





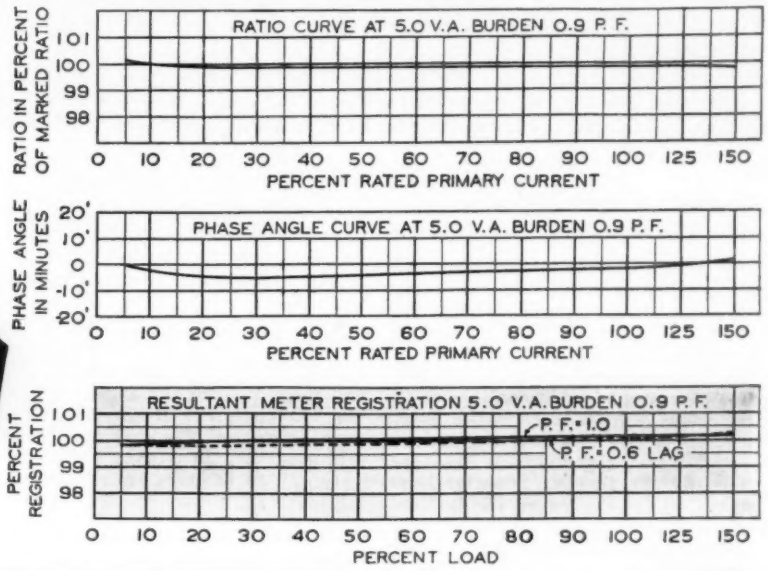
Some three miles of fluorescent lamps provide illumination in this Ordnance Plant (its name or location cannot be revealed) designed without windows or skylights. Below is the main switchboard utilizing the most modern type of metal clad switch gear.

SANGAMO TYPE M-6 CURRENT TRANSFORMERS



M-6 200 AMP. AND 400 AMP.

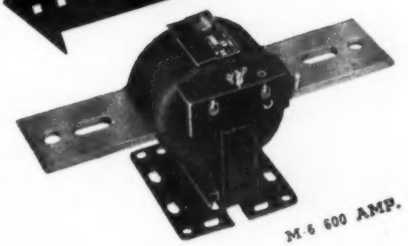
FROM THESE CHARACTERISTICS . .


RATIO CURVE AT 5.0 V.A. BURDEN 0.9 P. F.
RATIO IN PERCENT OF MARKED RATIO
101
100
99
98
0 10 20 30 40 50 60 70 80 90 100 125 150
PERCENT RATED PRIMARY CURRENT
PHASE ANGLE CURVE AT 5.0 V.A. BURDEN 0.9 P. F.
PHASE ANGLE IN MINUTES
20'
10'
0
-10'
-20'
0 10 20 30 40 50 60 70 80 90 100 125 150
PERCENT RATED PRIMARY CURRENT
RESULTANT METER REGISTRATION 5.0 V.A. BURDEN 0.9 P. F.
P. F. - 1.0
P. F. - 0.6 LAG
PERCENT REGISTRATION
101
100
99
98
0 10 20 30 40 50 60 70 80 90 100 125 150
PERCENT LOAD

The E.E.I. specified a metering current transformer, insulated for 600 volts in 200, 400, and 600 ampere ratings, capable of carrying 150% load without undue heating, and with electrical characteristics which, with a burden of 5 volt amperes at 90% power factor, would not affect the watthour meter accuracy at any power factor from unity to 60% lagging more than plus or minus ½ of 1%.

How the Sangamo Type M-6 Current Transformer meets and exceeds these specifications is shown in the watthour meter registration curve. Even though the variations are small, the ratio and phase angle curves have been so balanced in their individual trends, that they reflect a practically straight line meter registration from 5% to 150% load.

. . THESE RESULTS



M-6 600 AMP.

THE same high-permability, low-loss core materials used in other Sangamo Current Transformers are used in the Type M-6. Operation of these transformers at values up to at least 150% rated primary current is assured without exceeding a 55°C. temperature rise. The one-second thermal rating is 100 times normal current. The mechanical rating is 250 times normal current. The standard Sangamo secondary terminal block is supplied on all transformers. Weight, 10 pounds; height, 6⅛ inches; length, 12⅜ inches; width, 5 inches.

SANGAMO ELECTRIC COMPANY SPRINGFIELD ILLINOIS

NEWS of the INDUSTRY
National and Southern

Capacitor Installations Aid Victory Loads

A record installation of capacitors expected to be made within the next three months will permit existing facilities in a power pool of several companies centering around Houston, Texas, to deliver from 35,000 to 50,000 kilowatts of additional power to important defense loads in this area, chief of which is a new magnesium plant. These capacitors, to be supplied by the General Electric Company, will be applied on the systems of the Houston Lighting & Power Company, the Central Power and Light Company, and the Lower Colorado River Authority.

Most of this reactive correction is going on delta tertiaries of step-down autotransformers but some of it will be applied to distribution circuits. A network analyzer study has shown that the principal benefits from the reactive correction accrued on substations, generators, and transmission lines, particularly the latter.

Alternative methods of accomplishing the same result were considered but all involved installation of new lines and equipment which would require months to get into operation. Of great significance is the fact that the capacitors can be manufactured and placed in operation very quickly. Shipment on the first units starts in five weeks from date of the order. Of further significance is the fact that a relatively small amount of auxiliary and protective equipment will be required.

The capacitors are being obtained by the Defense Plant Corporation. They will all be outdoor type, 15 kva units in standard voltage ratings. Six hundred of the capacitors will be rated 2400 volts; 1722 will be rated 7200 volts; and 666 will be rated 7960 volts.

Code Change Permits Use Of 1937 Code Wire Rating

The National Electrical Code has been modified to permit, for circuits not operated continuously, the higher current-carrying capacities specified in the 1937 edition of the National Electrical Code for conductors insulated with Code grade rubber, according to an announcement by Alvah Small, chairman of the Electrical Committee, NFPA. This enables the use of smaller sizes of conductors with consequent saving in copper and rubber needed in the war effort.

The modification, embodied in Tentative Interim Amendment No. 41 which has been declared adopted and recommended for application in the administration of the 1940 National Electrical Code, is a note to follow Section 3004 (page 85) of the 1940 edition of the Code reading as follows:

"NOTE: For the duration of the defense emergency and to assist in the conservation of copper and rubber, conductors having Code grade rubber insulation that are not operated continuously with maximum currents may have the allowable current-carrying ratings that were given them in Table I of the 1937 edition of this Code and the limits of allowable current because of more than three conductors in a raceway (Note 5, page 303, 1940 text) and because of room temperature being over 30 C (Table I, page 301, 1940 text) need not be applied."

Edison Institute Annual Meeting Cancelled

Due to heavy demands the war is imposing upon electric utility companies, the regular annual convention of the Edison Electric Institute will not be held this year, C. W. Kellogg, president of the Institute announced recently following a meeting of the Board of Trustees. The annual convention had been scheduled for the first week in June at Atlantic City.

San Antonio Code Revised

A change has been made in the electrical code of the city of San Antonio, Texas, which will lower the specifications for electrical wiring on defense housing projects. The change was made at the request of the War Production Board, it being reported that no priorities could be issued in the San Antonio area defense housing until the ordinance had been amended.

Billion in War Goods Produced by G-E

General Electric management confidently expects to produce approximately a billion dollars worth of highly diversified war materials during 1942, Charles E. Wilson, president of the company, announced at the annual stockholders' meeting in Schenectady, N. Y. That this goal may reasonably be achieved is indicated by the fact that last month's output was at an annual rate of $860,000,000. This performance, Mr. Wilson pointed out, has been achieved without the benefit of new plants not yet in operation and without complete use of recently added facilities.

"Notwithstanding the magnitude of the task we so suddenly assumed, I am happy to report that in practically every important item production is meeting the Victory Program schedules set by the service departments of the government," Mr. Wilson said. "In a number of outstanding items, production is considerably ahead of schedule requirements."

The G-E president "repeated for the record" the offer to make available any of General Electric's designs and techniques that may be required for the Army or the Navy, for manufacturing by others, for the duration of the war, whether patented or unpatented. He pointed out that even before Pearl Harbor, as well as thereafter, the company had freely given patents, designs, and experience to others, many of whom were ordinarily competitors. "Men who go to war not only give their time and money to their country, but some part of themselves. In this emergency, corporations can do no less," he declared.

"We have made it clear in various public statements during the past 18 months that General Electric has no intention of profiteering on war business," Mr. Wilson told stockholders, "but rather desires only the assurance that its capital will not be impaired by reason of its adherence to the policy of all-out production. This is our basic policy. The company has declared to the government its willingness to renegotiate any contract for war equipment just as soon as actual costs are known, and in the event that these provide other than reasonable profits."

Recommended Practice Of Industrial Lighting

"American Recommended Practice of Industrial Lighting," a report prepared by the Committee on Lighting Practice, of the Illuminating Engineering Society, with the active collaboration of a Sectional Committee organized under the procedure of the American Standards Association, has received official approval as American Recommended Practice A-11-1942 from the American Standards Association.

Of recognized importance to the efficiency of the nation's war effort in that it presents factory owners and operators with a guide to good, up-to-date lighting practice, this comprehensive report is intended to supersede the I.E.S. revised "Code of Lighting: Factories, Mills and Other Work Places," which was approved as an American Standard in 1930.

The distinguishing feature of this new edition of I.E.S. industrial lighting recommendations is its emphasis upon basic principles of good lighting, including the "vital correlation between lighting and plant safety, the salient differences between good and poor illumination, and some of the precautions which must be observed before adequate and suitable lighting (and, hence, good seeing) can be achieved and maintained."

The benefits which good illumination can bring to an industrial plant are outlined and commented upon in this report. Although the advantage of increased safety is stressed, greater accuracy of workmanship, expanded utilization of floor space and improved morale are also pointed to as means of speeding up industrial production through better lighting.

Hotpoint Announces Utility Division

To work closely with public utilities in the solution of war time problems involving defense housing, army and navy camps and bases, the Edison General Electric Appliance Co., Chicago, has inaugurated a new department to be known as the Utility Division. Heading the newly formed division is August H. Jaeger, who until recently has been manager of the water heater sales division which has now beeen merged with the range division under W. R. Schafer.

Mr. Jaeger has a background of twenty years' service with Hotpoint organization. Widely acquainted among electric utility executives, he has served as chairman of the Electric Water Heating Section of NEMA, as well as head of its Advertising and Sales Promotion Committees. He is president of the Chicago Sales Executives Club and is an active member of the National Federation of Sales Executives.

August H. Jaeger

With the sale of refrigerators, ranges, water heaters, home laundry and kitchen equipment on a strict priority basis, and merchandise sales by utilities reduced to a minimum or eliminated entirely, the Hotpoint program is one of future planning—cooperation with the utilities and distributors in laying the groundwork for directing the great flow of merchandise to consumers that is certain to follow the war period. In announcing Mr. Jaeger's appointment, G. H. Smith, Hotpoint general sales manager, said:

"Hotpoint believes in full preparedness for war in times of peace, and, conversely, it believes in full preparedness for peace in time of war.

"Our entire manufacturing facilities are gradually being converted to war production. In the meantime, without losing sight of the important objective of winning the war, we intend to be in position to handle our share of the responsibilities of peace."

Electrical Ordinance Modified for Duration

Recognizing the need for low-cost defense housing and the increasing limitations on critical construction materials, the Shreveport, La., City Council recently adopted the following ordinance:

"Section 1: That for the period of the present emergency and for six months thereafter or until this ordinance be sooner repealed, electrical permits, as now required by the existing ordinances of the City of Shreveport, may be granted for the installation of material and equipment that do not conform to the requirements of the electrical code but do conform to provisions of the Defense Housing Critical List, issued by the War Production Board, effective February 24, 1942, and although the drawings and specifications therefor do not conform to the requirements of Electrical Ordinance No. 1 of 1941, in so far as said Ordinance relates to the use of critical materials; it being understood that critical material means an item which is produced for the construction of equipment of buildings and which is subject to priority, allocation or limitation control by the War Production Board.

"Section 2: That in the judgment and opinion of the Council the subject matter of this ordinance is urgent and deals with and is adopted as an emergency and shall take effect as an emergency ordinance immediately upon adoption."

ELECTRICAL VICTORY SYMBOL—The St. Louis Electrical Board of Trade recently accepted full rights to introduce and publicize nationally this specially designed insignia which has been designated as the "Electrical Industry's Own Victory V," emphasizing the V in KVA. The insignia was designed by the James R. Kearney Corp., and made available to the industry with the understanding that it shall be used solely as an "industry stimulant" and not for advertising purposes. The official presentation was made to W. E. Henges, center, president, and C. H. Christine, secretary, of the St. Louis Board of Trade, by James R. Kearney, Jr., left, president of Kearney Corp.

Arkansas Association Meets at Hot Springs

A group of outstanding speakers are scheduled to address the thirty-first annual convention of the Arkansas Utilities Association to be held at the Arlington Hotel, Hot, Springs National Park, Arkansas, on May 18 and 19, according to announcement by W. F. Thomas, president of the association, and R. E. Ritchie, secretary.

Among the speakers to be presented will be Dr. George S. Benson, president of Harding College; Ben E. Carter, chairman Department of Public Utilities for the state of Arkansas; Davis M. DeBard, vice president Stone & Webster Service Corp., New York City; Dr. Gus M. Dyer, Vanderbilt University, Nashville; J. N. Heiskell, editor, Arkansas Gazette, Little Rock; Albert S. Johnson, president, Southern Union Gas System, Dallas; C. Hamilton Moses, president, Arkansas Power & Light Company, Little Rock; Harold F. Smiddy, Ebasco Services Incorporated, New York City; and Frank M. Wilkes, president, Southwestern Gas & Electric Company, Shreveport, La.

Election of Officers of Graybar Electric Company

At the annual meeting of the board of directors of the Graybar Electric Company, the following were re-elected to serve as officers of the corporation: F. A. Ketcham, former president and now chairman of the board; A. H. Nicoll, president; G. F. Hessler, D. H. O'Brien, E. W. Cashman, vice-presidents, with headquarters in New York, and W. P. Hoagland, Chicago, W. J. Drury, New York, and A. L. Hallstrom, Philadelphia, as field vice-presidents.

E. W. Cashman, vice-president, was appointed to serve on the executive committee, joining Mr. Drury, Mr. Hallstrom, Mr. Hoagland, Mr. Ketcham, and Mr. Nicoll continuing members previously appointed.

Dr. Luckiesh Will Make Good-Neighbor Flight

Dr. Matthew Luckiesh, director of Lighting Research Laboratory at General Electric's lamp department, Cleveland, Ohio, will be North America's "ambassador of light and sight" to South America this summer, it was announced recently at the company's Nela Park lighting headquarters.

Scheduled to take off from Cleveland by plane on June 18, the famous lighting scientist will visit the chief cities of Argentina, Brazil, Uruguay, and possibly Chile. He expects to return about July 20.

Climax of his 15,000-mile flight will take place in Rio de Janeiro

Dr. M. Luckiesh

where—at the First Inter-American Conference on the Prevention of Blindness, July 1 to 5—Dr. Luckiesh as guest speaker will deliver the main address. His topic, "The Partnership of Light and Sight," will encompass the Science of Seeing and its relationship to mankind both in peacetime and at war. According to the philsopohy of Dr. Luckiesh, it is the responsibility of science to stamp out wherever possible the conditions which contribute to the loss of any part of human sight.

Wholesalers' Association To Meet at the Homestead

The Thirty-fourth Annual Convention of the National Electrical Wholesalers Association will be held at The Homestead, Hot Springs, Virginia, May 17-20, 1942, according to announcement by E. Donald Tolles, managing director.

Southwest Utilities Form Power Pool

Operating engineers of eleven principal private firms operating in Texas, Louisiana, Arkansas, Oklahoma, Mississippi, Missouri, Kansas and Nebraska, met in Dallas recently to plan a pooling of electric power resources to war industries.

C. S. Lynch, executive vice-president of the Arkansas Power and Light Company, said the southwest power pool was formed as a patriotic measure to insure sufficient power for war industries.

"The power pool," he said, "will have a total of more than 1,500,000 kilowatts of capacity, of which upwards of 200,000 kilowatts is estimated as surplus. It is estimated that some 65,000 kilowatts of this surplus capacity will be used to help operate the large aluminum plant near Little Rock . . . when that plant is completed."

Florida Subcontracting Making Good Progress

The Hillsborough County Manufacturers Defense Pool, with headquarters in Tampa, Fla., is making a drive to enlist all manufacturers in an effort to get war contracts.

Twenty-five firms have signed up with a total of more than 200 machines listed. Frank M. Cooper, president of the pool, said a membership fee of ten dollars was being charged each member to help pay expenses of an engineer and the cost of preparing a brief listing the available equipment which will be sent to Washington.

Equipment found includes lathes, drill presses, grinders, and many other kinds of equipment for processing metal. Mr. Cooper said the greater variety of equipment found here the better the chances for a contract.

Officers of the pool, which has been formed as a non-profit organization are: George M. Holtsinger, first vice-president; W. Howard Frankland, second vice-president; James G. Anderson, secretary.

Members of the board of directors are: Arthur R. Christy, J. F. Townsend, Henry A. Van Borssum, William J. Lieman, L. E. Jones and Henry H. Huff.

Those already signed up as members of the pool include: Louis Dron, boat yard; J. P. Cook, roofing; W. J. Lieman, box factory; George M. Holtsinger, automobile shop; W. J. Jungmeyer, automobile shop; J. L. Stevens, auto parts; John Jiretz, sheet meal; Joe M. Aizpuru, sheet metal.

J. F. Townsend, lumber; C. C. Parker, fountain pen factory; A. R. Cameron, metal products; Dave Fyfe, truck body shop; Henry A. Van Borssum, machine shop owner; L. W. Todd, electrical contractor; Mrs. William Felder, tents and awnings; S. L. Flom, steel bars; W. Alderman, foundry; B. M. Griffith, lumber; Lyndon Mott, interior decorator.

Get in the SCRAP

America's war industries need

METALS
PAPER
OLD RAGS
RUBBER

Get it back in war production

Washington News Reviewed in Brief

April 2. Fluorescent Lighting Fixture Production Limited. The War Production Board ordered an immediate end to the production of fluorescent lighting fixtures except for essential uses, or on contracts accepted prior to today, on which work had begun.

There are approximately 2,000 companies which produce fluorescent lighting units and parts. Because of the relative youth of the industry, accurate data is not available on recent production and sales. It is estimated by the WPB Building Materials Branch, however, that the dollar volume in 1942, on an unrestricted basis, would have been about $100,000,000, representing 10,000,000 units.

The terms of the order prohibit the manufacture or assembly of any fluorescent lighting fixture or part, notwithstanding existing contracts or agreements, except on orders bearing a preference rating of A-2 or better.

Effective 61 days from today, the sale, delivery, or transfer in any way of fixtures and parts is prohibited except on an order bearing an A-2 or better rating, or for parts sold for maintenance and repair.

Production of fixtures and tubes for servicing and replacing worn out equipment on existing installations is not limited by the order. Manufacturers will be allocated materials to keep existing fluorescent fixtures in operation.

April 7. Production to Stop on Consumers' Durable Goods. Donald M. Nelson, chairman of the WPB, said that orders already issued or about to be signed provide for the virtual cessation of consumers' durable goods industries using critical metals in the United States and the conversion of their men, plants and facilities to an all-out war effort.

Some production is still being carried on, but within three months almost all of it will be stopped except for that production necessary for war and essential civilian purposes. The elimination of less-essential production and the conversion program have already changed the face of American industry and are now harnessing the entire economy to war.

The electrical products whose manufacture has been prohibited and dates after which production must cease are as follows: grills, May 31; ironers, April 15 and May 15; irons, May 31; roasters, May 31; toasters, May 31; waffle irons, May 31; massagers and vibrators except medical use, May 31; metal home kitchen cabinets, May 31; portable washing machines, April 15 and May 15; pressing irons, boudoir and travel, May 31; record makers and players, April 23; sun lamps except for medical use, May 31; kitchen table tops for household use, May 31; household vacuum cleaners, April 30; household washing machines, April 15 and May 15; phonographs, April 23; dry shavers, May 31; electric hand and face driers, May 31; broilers, May 31; percolators, May 31; food warmers, May 31; mixers, whippers and juicers, May 31; refrigerators, April 30; and radio receivers, April 23.

April 9. New Building Construction, Except for War Effort, Limited. A drastic Government order blocked virtually all new construction work, private and public, except for the war effort, went into effect.

The War Production Board's order prohibited any residential construction other than maintenance and repair work if the cost was $500 or more, forbade any new agricultural construction of $1,000 or more, and specified that no other types of construction—commercial, industrial, recreational, institutional, highway or utilities, whether publicly or privately financed—could be started if the cost was more than $5,000.

The only exceptions were in cases where specific Government permission might be granted.

Further, said WPB, projects now under construction are being examined individually, and may be stopped "if the scarce materials to be used in them can be put to more effective use in the war program."

The $500 limit on residential construction applies to a full year; that is, an owner may not spend $500 on a dwelling and later make another $500 outlay on the same building. Similar restrictions apply to farm and other construction maximums.

The order did not change existing regulations permitting construction of residences, costing up to $6,000, in defense housing critical areas, designated as such by the Government.

April 10. Ruling Issued on Appliance Excise Tax. Under the temporary maximum price regulation recently issued for domestic electrical appliances, sellers may continue to pass on the Federal manufacturers' excise tax, the Office of Price Administration announced.

This point was set forth in Amendment No. 1 to Temporary Maximum Price Regulation No. 18 and conforms to long-established practice.

The temporary price regulation that became effective last month, established maximum retail, wholesale and manufacturers' prices of 44 electrical household appliances at the March 30 levels.

April 10. Interpretation Issued on Method of Determining Maximum Prices on Appliances. Methods by which dealers are required to compute maximum retail prices for radios, phonographs, washing and ironing machines, and domestic cooking and heating stoves and ranges were reiterated by Price Administrator Leon Henderson.

NICKELS FOR NIPPONESE PLANES—An electrician's helper, V. A. Norman, of the U. S. Naval Air Station at Jacksonville, Fla., recently originated a new idea to aid in "Keep 'Em Flying," and it has been so astoundingly successful that he has won the praise of Navy officials and fellow workers alike. Designated as "Nickels for Nipponese Planes," the plan requires each member to purchase a 25-cent defense stamp every time five Japanese airplanes are shot down by U. S. airmen. Left to right, V. A. Norman, who originated the idea, Lt. Com. Richard R. Briner, official scorekeeper, N. G. Forsyth, electrician's helper, R. A. Watson, radio mechanic, and R. M. Coleman, electrician.

The temporary regulations covering these appliances became effective March 19, 1942. Each order stipulated that the maximum dealer price for each appliance was to be the highest net price for which the individual dealer sold the same model on March 19. If no sale was made on March 19, the highest net price the dealer received for the nearest previous sale must be used to determine the maximum price.

OPA explained that the price ceilings apply to each store individually and that the regulations do not mean that all stores must charge the same price for the same article. Each merchant, under the law, may set his price as high as, but no higher than, the top price he sold the same model for on March 19, or the top price he charged for it on the nearest previous sale if he did not sell that model on that date.

Information reaching OPA indicates that many dealers have misconstrued the pricing formula and are using the manufacturers' suggested retail prices as their ceiling prices. This is a violation of the regulations and must be corrected immediately. Manufacturers' suggested retail prices are established as the maximum prices in the case of household mechanical refrigerators and vacuum cleaners, covered by the permanent Maximum Price Regulations Nos. 110 and 111.

OPA has also been informed that many dealers have neglected to post conspicuously in their establishments the retail prices for these appliances as set forth in the regulations.

April 20. Refrigerator Freeze Order Amended. The refrigerator freeze order has been amended to clear up three points about which questions have arisen. No additional refrigerators are made available by this amendment. The amendment provides that:

1. Any person other than a distributor or manufacturer who buys an electric refrigerator from any person other than a distributor or manufacturer, may re-sell that refrigerator. The main purpose of the provision is to enable a refrigerator dealer who wants to get out of business to dispose of his entire stock of electric refrigerators to another dealer.

2. Any person may ship or transfer from one location to another any new domestic mechanical refrigerator to which he held full legal title prior to the issuance of the freeze order. This is intended mainly to permit manufacturers to transfer their refrigerators from one warehouse to another.

3. A person who ordered and paid for a refrigerator prior to the issuance of the freeze order is entitled to such refrigerator. Here are two examples: (1) A dealer ordered and paid for in full a shipment of refrigerators prior to the issuance of the freeze order. Such refrigerators are considered to be a part of the stock of such dealer and may be shipped to him by the manufacturer or distributor without violating the freeze order, provided the manufacturer or distributor had them in his stock at the time the freeze order was issued. (2) A consumer ordered and paid for in full a refrigerator prior to the issuance of the freeze order but did not receive delivery of it. Such refrigerator may be delivered to the consumer, provided the refrigerator was in the dealer's stock before the issuance of the freeze order.

April 24. Restrictions Eased on Small Fluorescent Lighting Fixture Production. The War Production Board has amended Limitation Order No. L-78, on fluorescent lighting fixtures, to ease the restrictions on production and sale of small fixtures and to set a definite closing date on the manufacture of other types.

The original order required that production of all fixtures end on April 22, except for certain rated orders and fixtures in process of manufacture. Amendment No. 1, effective yesterday, allows the manufacture without restriction of fixtures with a lamp capacity of 30 watts or less if the materials were ordered on or before April 2 and actually on hand by April 20.

The small fluorescent fixtures may also be manufactured if the materials to be incorporated into them are acquired under an A-2 preference rating or under any rating assigned under the Production Requirements Plan.

Under the terms of the original order, no fluorescent lighting fixture could be sold or delivered after June 1, except on orders bearing a preference rating of A-2 or better, or for purposes of maintenance and repair. The amendment allows the unrestricted sale of the small fixtures and of cold cathode (high voltage) fluorescent lighting fixtures.

April 25. Domestic Mechanical Refrigerator Limitations Do Not Apply to Quick-Freeze Units. The WPB orders in the L-5 series governing the production and sales of domestic mechanical refrigerators do not apply to a low temperature mechanical refrigerator designed for the storage of frozen foods or for the quick-freezing of food, when the low temperature compartment contains more than 75 per cent of the total refrigeration space, the War Production Board said in an amendment (No. 2) to the order.

W. S. Hammersley, Chief of the Domestic Refrigerator Section, said it was never intended to include such refrigerators in the domestic refrigerator order but that the amendment was issued to clear up confusion that has existed over it.

54 New Members Enrolled in I.A.E.I.

Fifty-four new members have been enrolled in the Southern Section, International Association of Electrical Inspectors, since the annual meeting of the section last October, according to a report by C. M. Jones, secretary of the Southern section.

Members of the section who have been instrumental in enrolling new members are listed below with the number of new members endorsed by them:

Bagwell, H. O. Carrollton, Ga.	1
Boger, C. A. Charlotte, N. C.	1
Bommer, A. J., Dallas, Tex.	3
Bushnell, R. O., Miami, Fla.	2
Byrum, R. L., Greensboro, N. C.	1
Campbell, R. D., Asheville, N. C.	2
Camus, F. G., Shreveport, La.	1
Davis, James E., Galveston, Tex.	4
Eberling, J. H., Houston, Tex.	1
Edwards, Steve, Quincy, Fla.	1
Edwards, T. W., Jacksonville, Fla.	1
Fisher, Jack, Jackson, Miss.	7
Flynt, H. F., Winston-Salem, N. C.	1
Guess, Earle B., Jackson, Miss.	2
Hancock, A. E., Austin, Tex.	1
Harpster, R. L., West Palm Beach, Fla.	1
Hayes, Ray, Corpus Christi, Tex.	1
Hendricks, R. B., San Antonio, Tex.	1
Houston, O. A., Durham, N. C.	1
Johnson, Dewey, Atlanta, Ga.	1
Jones, C. M., Atlanta, Ga.	1
Julian, L. H., Salisbury, N. C.	1
McConnell, E. S.	1
Meullier, R. W., Ft. Lauderdale, Fla.	1
Miller, G. M., Richmond, Va.	1
Peeples, Troy, Roby, Tex.	1
Peters, K. O., St. Petersburg, Fla.	1
Rousseau, G. C., Salisbury, N. C.	2
Sampson, T. W., Jr., Jackson, Miss.	1
Stall, W. A., Jacksonville, Fla.	1
Stanford, A. C., Atlanta, Ga.	1
Welman, Geo., New Orleans, La.	1
Whitaker, C. S., Durham, N. C.	5
Whiting, C. T.	1
Zimmer, Charles, Houston, Tex.	1
Total	54

Brooder Campaign Successfully Completed

With one record for the installation of electric brooders broken and what is believed to have been another record established, the Rural Service Engineers of East Tennessee Light & Power Company have recently completed their most successful campaign since the establishment of the department.

Between January 15 and March 20, some 289 electric chick brooders are known to have been installed through local dealers, with approximately 70 more purchased direct by farmers from mail order houses, in the territory served by the company. This figure exceeds any past six months figure on the same equipment. According to the Washington County farm agent, the 116 electric brooders installed in that county was the most for any county in the state.

The campaign was organized by Don Alexander, rural service supervisor, and a detailed program was closely followed that provided for systematic dealer contacts, farm meetings and visits to individual farmers. These personal efforts were backed by newspaper advertising and service bill stuffers that followed the

Department of Agriculture's pleas for increased egg production.

Eighty-three farm meetings with a total attendance of 3,307 were held. There were 115 dealer contacts, and 440 visits were made to individual farmers and poultrymen. Window displays of both manufactured and home-made electric brooders with live chicks were maintained in company display windows. These brooders were also used in demonstrations at the farm meetings.

New Transmission Book Ready for Publication

"Electrical Transmission and Distribution Book," recently published by Westinghouse Electric and Mfg. Co., is a fitting sequel to William Nesbit's authoritative book, "Electrical Characteristics of Transmission Lines," considered the classic of the electrical industry so far as transmission problems are concerned. Much of the data and experience reported in the new book are the results of scores of tests on actual power lines made possible only by the wholehearted cooperation and actual support of power companies themselves. Among the authors are such well-known authorities as R. D. Evans, A. C. Monteith, and C. F. Wagner.

Since Nesbit's work was published, many changes have taken place. Voltages have more than doubled; lines are longer; interconnections are more extensive and new methods of calculating performance have been adopted. These and other advances in the science have pointed to the need for a new text, and the new book is the product of fourteen Westinghouse central station engineers, each contributing to one or more chapters.

Each aspect of transmission and distribution is treated as a separate chapter. Although the patterns necessarily differ somewhat, the general plan is to present first the essential background information on the subject and the basic principles followed by all the necessary working data in tables and curves with illustrative examples. It is intended as a practical text for the man concerned with the actual power system.

When published, the book will total 576 pages and will be bound in serviceable fabricoid cover. The practical nine by twelve inch size was selected to permit the reproduction of curves large enough for maximum legibility and usefulness. The book is for sale only, the price being five dollars, post paid.

New Defense Housing Areas

Blackstone, Va., Richmond, Va., and Point Pleasant, W. Va., have been added to the Defense Housing Critical Area list.

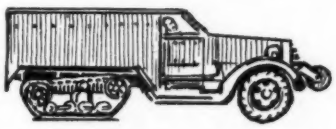
RUBBER COVERED POWER CABLES • BUILDING WIRE

CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE

VARNISHED CAMBRIC • FLEXIBLE CORDS • LEAD-ENCASED AND PARKWAY CABLES • ARMORED CABLE

It's a War of Machines!

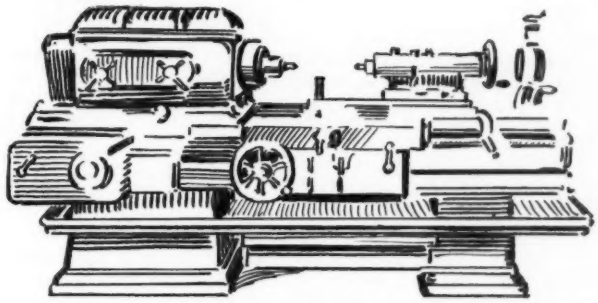
CRESCENT CABLE



for Air, Land and Sea

All kinds of INSULATED ELECTRICAL CONDUCTORS

for all Machinery, Buildings and Equipment necessary to WIN THE WAR



War Production 100%

CRESCENT INSULATED WIRE & CABLE CO.

Ask Your Wholesaler For

CRESCENT WIRE and CABLE

Factory: TRENTON, N. J.—*Stocks in Principal Cities*

SOUTHERN REPRESENTATIVES

ATLANTA, GA.	NEW ORLEANS, LA.	DALLAS, TEXAS
Edgar E. Dawes	Paul Hogan, Jr.	Huie-Simmer Co.
A-4 Rhodes Bldg. Annex	823 Perdido St.	103 Thomas Bldg.

CRESCENT ENDURITE SUPER-AGING INSULATION

PERSONAL NOTES
About Men You Know

E. F. Graham, rate engineer and member of the board of directors of Southwestern Gas and Electric Company, was appointed to the position of assistant to the president, effective April 1, it was recently announced by Frank M. Wilkes, president. Mr. Graham's association with the electric industry goes back to his graduation from North Carolina State College when he went to Lynn, Mass., with the General Electric company on their test course. From there he went to Marshall, Texas, as assistant to the chief engineer and later became assistant to the general manager.

In 1927 he went to Texarkana as assistant to the executive vice-president of Southwestern Gas and Electric Company. He came to Shreveport in 1928 and later that same year went to Dallas as assistant to the chief engineer of the Central and Southwest Utilities Company. In 1932, he returned to Shreveport as rate engineer and later became head of the rate department of Southwestern Gas and Electric Company, which position he now holds.

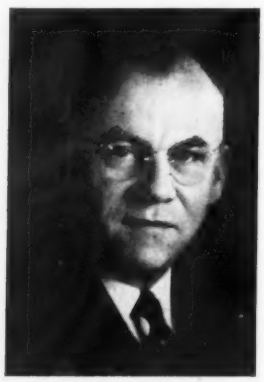
* * *

Upon the recommendation of **J. E. Kewley,** vice president of General Electric Company, Nela Park, Cleveland, **M. L. Sloan** has been advanced from assistant manager to manager of the lamp department.

J. E. Kewley continues at Nela Park as General Electric vice president in general charge of the lamp department.

A native of Sioux City, Iowa, Mr. Sloan attended Iowa State College where, in 1910, he received his Bachelor of Science degree in electrical engineering. His first job was with the old General Electric National Lamp Works in Cleveland where he was employed as commercial engineer. In 1912 he was transferred to the Youngstown (Ohio) lamp works where, in only a few months, he was advanced to the position of assistant manager.

In 1913, Mr. Sloan was transferred to the new Nela Park headquarters. After serving for less than a year in the manufacturing department, he was advanced to assistant general manager of manufacturing. He was made manager of the lamp manufacturing department in 1921, was transferred to the Administration Department at Nela Park in 1927, and was appointed assistant manager of the lamp department in 1931.



M. L. Sloan

* * *

Marshall Hurt, well known in the advertising field of the South, has recently been named advertising and public relations manager for the Gulf States Utilities Co., of Baton Rouge, La. A native of Birmingham, Ala., Mr. Hurt is a graduate of Tulane University New Orleans. Following a brief period of radio work in Jackson, Miss., he established his own advertising agency which he operated until he joined McCann-Erickson in January, 1941. Mr. Hurt was in charge of the agency's Memphis office until last July when transferred to New Orleans, where he became the account executive with Walker Saussy Advertising, affiliated with McCann-Erickson, of New York.

* * *

The Spero Electric Corporation announces the appointment of **Neil B. Walsh** as special factory representative to cover the entire country. Mr. Walsh has been with The Spero Electric Corporation for two years covering the Ohio Michigan territory and is well known throughout the industry through his former connection with Steel and Tubes, Inc.

The Spero Electric Corporation also announced the appointment of **E. Vernon Murphy,** 111 Cheapside St., Baltimore, Maryland, to cover Baltimore and Washington, D. C., and the appointment of **James T. Heagarty,** Richmond, Virginia, who will cover Virginia and North Carolina.

* * *

John H. Ashbaugh, manager of manufacturing and engineering of Westinghouse Electric and Manufacturing Company's merchandising division since November 1941, has been appointed manager of that division with headquarters in Mansfield, Ohio.

Prior to his appointment as manager of manufacturing and engineering of the merchandising division last fall, Mr. Ashbaugh had been acting manager of those activities in the Westinghouse plants at Mansfield and Springfield, Mass., since January, 1941.

Starting with Westinghouse in 1918 as a student engineer in the East Pittsburgh works, Mr. Ashbaugh remained on the student course only two months before he was assigned to the company's activities in the comparatively new field of instruments for aircraft wireless sets. Next he worked on meters and relays, then became section engineer in the automatic regulator section, where he developed voltage control apparatus for power houses and industrial applications.

J. H. Ashbaugh

Mr. Ashbaugh was transferred to the merchandising division in 1931, as assistant manager of engineering at the Springfield works. In less than a year he was named manager of engineering at the works.

* * *

At the recent annual meeting of Square D Company, **George W. Mason,** president of Nash-Kelvinator Corporation, was elected a director in the place of **F. Eberstadt,** president of F. Eberstadt & Co., Inc., who recently resigned as a director owing to his appointment to a U. S. Government post. Other directors were re-elected.

Mr. Mason is a prominent figure in the automotive and electric refrigeration industries and is regarded as

Geo. W. Mason

INCREASE WATTAGES FOR WAR WORK

WITH SMALL DIAMETER

FLAMENOL* BUILDING WIRE

(FOR REWIRING EXISTING RACEWAYS)

This small-diameter synthetic-insulated building wire enables the substitution of more wires or wires of larger capacity in existing raceways. Think of the additional power that can be distributed by rewiring with Flamenol wire. With it, effective copper area in some cases can be increased as much as 400 per cent. Here indeed is an electrical conductor that can be used to advantage in aiding the war effort.

Rewiring jobs can be completely done with Flamenol Building Wire—new feeders, new sub-feeders, new branch circuits. Flamenol is available in sizes 14 to 4/0 inclusive.

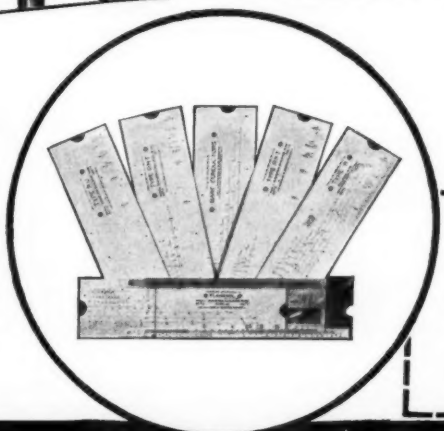
The use of Flamenol Building Wire conserves rubber. It is insulated with a plasticized polyvinyl chloride compound. This synthetic compound has high dielectric and mechanical strength, is flame retarding, and is resistant to oils, acids, alkalies and moisture. The compound serves both as an insulation and a finish.

Flamenol Building Wire is easy to pull and handle. It is available in a variety of bright permanent colors making circuit identification easy. For samples and further information see the nearest G-E Merchandise Distributor or mail the coupon.

*Reg. U.S. Pat. Off.

G-E WIROMETER FOR COMPUTING WIRING PROBLEMS

You'll find the Wirometer helpful in selecting the right wire quickly when making layouts. The Wirometer permits quick calculation of conduit fill, current-carrying capacities when three or more wires are run in conduit, etc. Wirometers may be obtained from G-E Merchandise Distributors.



General Electric Co.
Section W522-16
Appliance and Merchandise Dept.
Bridgeport, Conn.

Sirs: Please send me samples and information on Flamenol Building Wire.

Name .....
Address .....
City.....State.....

GENERAL ELECTRIC

an expert manufacturer and business administrator. He also coordinated the activities of Rock Island Arsenal during the first World War.

* * *

H. E. "Gene" West, formerly district manager for Anaconda Wire & Cable Company, with headquarters in New Orleans, has been transferred to Atlanta to head the new Southern Division of the Anaconda Wire & Cable Company as manager with supervision over Charlotte, Atlanta, and New Orleans districts. Mr. West has been associated with Anaconda for the past seven years. Before that, he worked for both General Electric Company and General Electric Supply Corp.

W. B. Meek will succeed Mr. West as district manager for Anaconda in the New Orleans area. Mr. Meek was formerly connected with the Monroe Hardware Company. When he left that organization to join Anaconda, he was vice-president and director in charge of the electrical department.

* * *

Paul V. Sprout, former assistant service sales manager of the Frigidaire Division of General Motors Corporation, has been appointed service sales manager succeeding **Virgil A. Hetzel,** who died in December.

Mr. Sprout has been connected with Frigidaire, in the Service Department, since 1927, starting in the Technical Division. He served in this division one year, being transferred to the Organization Division until appointed Office Manager in 1932.

Paul V. Sprout

In January of 1936, he was promoted to the position of Assistant Service Sales Manager. During Mr. Hetzel's long illness, Mr. Sprout carried on the duties of the position to which he has now been permanently appointed.

* * *

Harold R. Brumbaum, sales manager of the department store division of Landers, Frary & Clark has been appointed senior business specialist in the Durable Goods Section in the Office of Price Administration. Mr. Brumbaum, who had charge of sales of merchandise to department stores for several years, has a wide experience in housewares and cutlery merchandise.

NEW EQUIPMENT and MATERIALS

Display for R & M Fans

Employing a patriotic color scheme in the costume of the shapely figure which is the keynote of the piece, Robbins & Myers, Inc., Springfield, Ohio, has prepared a new three-dimensional display for the approaching fan season. The design and finished painting in full color were executed in the art department of Hugo Wagenseil & Associates, advertising agency, of Dayton, and the display was lithographed in five colors. The seascape background suggests comfortable coolness. A silken red, white and blue sash fastened to the display at the girl's waist waves and flutters as it might in a breeze each time the fan oscillates in the direction of the figure.

Silex Safety-Lock Filter

The Silex Company, Hartford, Conn., is planning an aggressive promotion for the new Silex Perfected Safety-Lock Filter. An attractive 3-color bull's eye display card will be supplied with every filter order. Effective promotion will boost the filter as the one and only clothless device that will keep bitter grounds and sediment out of coffee brewed in glass coffee makers.

The New Silex Safety-Lock Filter is constructed on the same principle as the exclusive cloth strainer spring tension filter featured in all Silex coffee makers. However, this filter has the added advantage that it has no removable strainer and can be cleaned simply with hot running water. The special spring tension assures complete steadiness. The patented safety catch prevents the filter from falling out and cracking the upper bowl.

This unique new Silex filter fits Silex and other coffee makers, retails for 50c. For complete information, write direct to the Silex Company, Hartford, Conn., or see your local distributor.

Premier Authorized Agency

Consumer identification of dealers cooperating in Premier's "Revival" Service Plan is provided by an attention-getting decalcomania transfer that's designed for display on the inside of a window or door. It identifies the dealer as authorized to render service using genuine factory-built parts for Premier Cleaners.

Paint Preserves Cables

After extensive research, the John C. Dolph Company, Newark, N. J., has developed a black cable paint with excellent weather resisting properties. This paint, known as No. 737 Black Cable Paint, is absolutely oil and waterproof, extremely flexible and flame resistant one hour after application to cable. It is also highly resistant to corrosive fumes and heat.

A weathering effect test on several taped cables after one year exposure to the elements on a test rack at 45 degrees angle on a roof in an industrial district, indicated that the No. 737 Black Cable Paint still had a high degree of gloss and showed no indication of sunchecking or powdering upon conclusion of this test. Damage wrought by weathering is clearly visible on all other specimens, in the form of lack of glossiness,

Here in a nutshell

IS THE STORY WE ARE TELLING

Early this year, when the freshness of war turned things topsy-turvy, we kicked "business as usual" policies out the door, like most other American business firms. And on the heels of this needed action we announced a new Customer Service Plan to the public. Here in a nutshell, picked up bodily from the announcement advertisement, is what we told our customers—and it goes without saying that we are still promoting our Customer Service Plan. We hope it will help our customers. We believe it is a good business policy for us. And we are ambitious that, by conserving materials and power, it will help in the necessary production to win the war.

★ ★ ★ ★ A NEW CUSTOMER SERVICE PLAN---1942 MODEL ★ ★ ★ ★

Electricity drives the war production machine and it should not be wasted. If it is, it costs you money and reduces the supply available. We offer our services to help you find ways of using your electric equipment that will require *less* electricity rather than *more*. We also offer assistance in another matter made important by the war — *the conserving of metals.* Aluminum, copper, steel, zinc — all figure prominently in our delivery of electricity to you and also in your use of it. These metals are needed for guns, shells, planes, tanks. If we can help you conserve them — by getting longer life from your appliances or by repairing equipment and restoring it to use — it will save money for you and help win the war.

FOR INDUSTRIES, SHOPS, BUSINESSES—There are some wastes of power in nearly all industrial operations. We will help you eliminate them. Longer hours and harder work call for the best lighting possible. Often it can be obtained from present equipment and without increasing the use of electricity. We will help you get it. Many small plants and shops are threatened by shortages of materials. To the best of our ability, we will help you find your place in the war production plan.

FOR FARM FAMILIES—The government has asked you to produce "Food For Freedom." Before the year is out, many Georgia communities will probably have freezer locker plants for food preservation and new small industries for food processing. Georgia will also have more poultry and livestock, more growing of feedstuff, more gardens, more living-at-home and a greater production of food for war demands. But there are fewer hands than needed for this big job, because so many men are going to war. Electricity can help get the job done. Our rural engineers are prepared to tell you how electricity can help — also how it can be used most economically.

FOR HOMES EVERYWHERE — For a long time our women Home Service Representatives have been assisting women in the home in getting the best and most economical use of their electric service. Now that war has come, they are ready — trained in advance — to assist you in solving the new problems that have grown up because war is changing home life in so many ways.

Our Home Service representatives can show you simple and inexpensive ways of improving your lighting. They can show you the best and most economical ways of using your electric refrigerator, your electric range and other appliances. They can show you new methods of canning and preserving. They are prepared to help in the national nutrition program, to build strong bodies to withstand the hardships of war. They can help you in all these things and many others. Just call on them.

★ ★

Georgia Power Company

A CITIZEN WHEREVER WE SERVE

checking, and other indications.

The paint is suitable for application to all cables, such as power, control, degaussing, motor leads, splices, etc. It is supplied at heavy brushing consistency and provides a build up of 8 mils per coat, air dries in 15 minutes, and may be thinned with Dolph's No. 220 Thinner when necessary. It is supplied in 1, 5, 30, and 55 gallon containers.

New Cory Display Card

One of the attractive easel cards of the current Cory display features the 2-heat electric stove for brewing coffee at the table. Inasmuch as deliveries to the jobber of all electrical

equipment of this nature was ended on April first, dealers will soon be unable to get electric units. To meet the changed condition, a new "all heat" easel card has been put out for use with the display, matching it in every respect. It pictures a Cory brewer in use on different types of kitchen ranges, fueled by commercial or bottled gas, electricity, oil or gasoline, and coal or wood.

"Black-Out" Control Switches

A folder describing switches, relays and other control equipment especially suitable for controlling lighting during blackouts, air-raid sirens, and other such emergency applications, has just been issued by Automatic Electric Mfg. Co., Mankato, Minnesota, manufacturers of time switches, flashers, interval timers, etc.

Included in the bulletin is a description of an Automatic Air-Raid Siren Control, having momentary push-button start to sound alarm and all-clear signals. Also described is an Automatic Blackout Relay for instantly blacking out window lights, signs, billboards, etc. This equipment is available in a variety of ratings. Copies of the bulletin will be mailed upon request to the manufacturer.

Johnson Bearing Catalog

Johnson Bronze Company, New Castle, Pa., has just issued a new catalog covering their line of Ledaloyl, self-lubricating bearings.

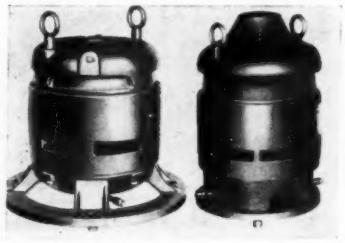
"The acceptance by industry of this new bearing has been very unusual. Only two years have elapsed since we first announced this new product, yet today there are several million in operation. Many of these bearings are now being used in planes, ships, tanks, gun turrets and military cars," reports Eugene Scanlon, sales promotion manager.

"Despite the heavy demands of the armament program, we can make reasonably good deliveries on Ledaloyl. Our main purpose in issuing this new catalog was that it would serve as a guide to designing engineers. By standardizing on any of the more than 2,000 sizes listed in the book, the purchaser enables us to make good delivery and eliminates the cost of extra tools and dies."

New G-E Tri-clad Motors

Three new motors—a vertical general-purpose polyphase motor, a vertical shielded polyphase motor (1 to 20 hp) and a vertical shielded single-phase motor (1 to 5 hp)—have been added to the General Electric Tri-Clad family. The shielded-type motors are especially suited to pumping applications, and the general-purpose motor is suitable for use in the machine tool industry as well as for agitators, mixers, and similar applications.

The compact, cast-iron frame and cover of the general purpose motors (at left in illustration) are designed to give added protection to electrical parts, without adding materially to the over-all height. The use of Formex wire, new punchings and coil shapes, double-end ventilation, and balanced design are features contributing to long life.



Accurate alignment of the motor to the driven unit is assured by machined rabbets on the stator frame and base. Rotating weight and thrust are solidly transmitted to the supporting base through the lower bearing, which is fitted to a one-piece base. Bearings are of the deeply grooved type, and are encased in machined cast-iron housings.

Many features of this Tri-Clad motor contribute to convenience of operation. Accessibility of grease fittings allows rapid lubrication without disassembly of the motor; the location of eyebolts makes the motor easy to handle; speed measurements are taken by removing the monogram cap from the upper end shield; a variety of bases makes it possible for this motor to meet many applications and mounting requirements.

The polyphase shielded-type motors are available in either solid-shaft or hollow-shaft construction, while the single-phase shielded-type motors are available only in solid-shaft construction. Both shielded types are for normal-thrust or high-thrust applications.

Cover is contoured to deflect dripping liquids and falling objects. All openings in the stator frame and end shields are protected against the entrance of splashing liquids. Air is discharged downward at low velocity, thus permitting little or no dust disturbance around the motor.

These motors are suitable for outdoor operation except where extremes of moisture, dust, or other harmful agents make the selection of fan-cooled motors more economical. All frame sizes have common mounting dimensions, making possible interchangeability of many horsepower and speed combinations, including single-phase ratings. The motors can be rotated to any one of four base positions without modification of the supporting structure.

Mercury Plunger Relay

The H-B mercury plunger relay, manufactured by H-B Electric Co., Philadelphia, has been completely redesigned and improved to insure its long life even under severe conditions of vibration and shock. Three important gains resulted from the change in design. (1) The metal cap and support frame that held the mercury tube were eliminated, thereby releasing strategic metals for the war. (2) The mercury tube was made secure by a single metal band which gives twice the stability of the previous design. (3) The area for terminal fastening and connecting was trippled thereby eliminating the danger of tube breakage and simplifying installation.

Magnetic Relay-Contactor

A new magnetic relay-contactor for use either as a relaying unit or motor starter has been announced by the General Electric Company. This new device, designated CR2790, is especially suitable for the control of pilot circuits, as a fractional-horsepower motor starter, or for use in conjunction with a magnetic switch controlling larger motors, heating or lighting circuits, or signal systems.

The relay-contactor can be supplied in either open form or enclosed in a general purpose housing. It is available in three contact arrangements—single-pole normally open, double-pole normally open, and double-pole, double-throw.

Wiring and servicing are simplified on the enclosed type by the use of a U-shaped cover which allows access to the front-connected terminals from three directions.

When the double-pole form is used with a momentary contact push-button station, undervoltage protection can be provided by using one pole as a holding interlock in the coil circuit.

Blackout Illumination Switch

The Photoswitch Blackout Switch presents a most economical, reliable and foolproof method for permitting illuminated billboards, store window displays, and other time switch controlled illumination to remain in operation in districts where blackout regulations are in effect.

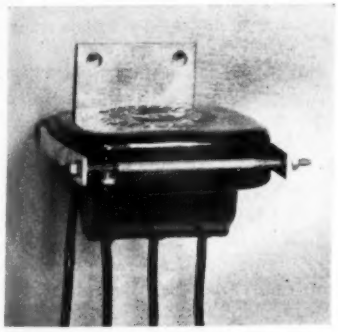
Photoswitch is located on the billboard or in the store window which is to be operated. It is aligned with the nearest street lamp. When this centrally controlled street lamp is turned out, Photoswitch observes this and turns off the illumination which it is controlling.

Photoswitch Blackout Control operates from a-c supply at 115 volts, and controls up to 20 amperes at 115 volts. The control is designed to operate independent of a momentary flickering of the street lamp, and also independent of ambient light conditions. Other types are available for d-c operation. Additional information with reference to this equipment can be obtained from Photoswitch Corporation, 21 Chestnut St., Cambridge, Mass.

New Outdoor Protector

To safeguard watthour meters and secondaries of transformers against lightning, a new outdoor protector is announced by the Westinghouse Electric and Manufacturing Company.

With a cutoff line to ground rating of 500 volts rms, the unit is for application on 33-phase circuits of from 110 to 575 volts. Discharge capacity is 200,000 amperes crest, and gap breakdown on impulse is 2500 volts average.



Enclosed in a wet-process porcelain casing to obtain moisture-proof construction, the unit is made up of porous block Autovalve elements.

When installing, the protector ground load is grounded to the meter case or conduit, equalizing the meter coil and protector potentials. This eliminates the possibility of a flashover from the meter case to the potential coils in meters which are insulated in accordance with modern practice.

Protective Lighting

For lighting industrial fences and areas for protection against sabotage, Fresnel luminaires are announced by the Westinghouse Lighting Division, Cleveland, Ohio. Two types are available SF-180 and the MF-180 for series and multiple circuits respectively.

Units can be mounted on poles and building walls and consist basically of a hood with socket and receptacle, mounting bracket, a reflector and lens assembly.

The hood is made of cast iron. The

SPEED UP THIS CHANGEOVER

Electrically via GraybaR

Here's help for those who face the important job of converting industrial plants to war production: GRAYBAR representatives can aid you in meeting *electrical* problems in the following ways:

● **REWIRING**... In relocating or augmenting the power distribution circuits, GRAYBAR can help you make the best re-use of present materials in combination with new supplies. Wide experience in industrial wiring practice, plus an up-to-the-minute knowledge of the delivery situation, makes for time-saving decisions.

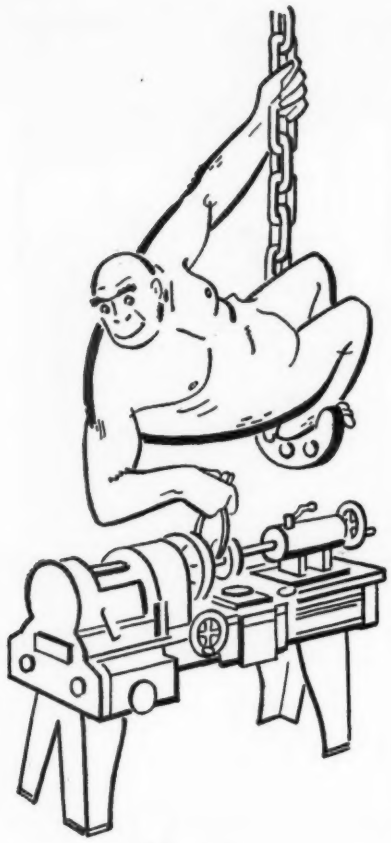
● **RELIGHTING**... Plants going to triple-shift operation, or taking on work requiring high precision, will need the best of modern lighting. The GRAYBAR Lighting Specialist can help you plan the system and pick units that best meet the needs of the seeing tasks.

● **"POWERING"**... When you look to GRAYBAR for motors, controls and other apparatus for efficient operation of power-driven equipment, you save time and avoid mix-ups by getting equipment that "goes together" from a single source.

● **PROTECTION**... Warning sirens, fire and burglar alarm systems, communication and paging systems, floodlights and other outdoor lighting... all are part of an overall protection setup that's efficiently arrived at with the help of GRAYBAR.

GRAYBAR
in over 80 principal cities
Executive Offices:
GRAYBAR BUILDING, NEW YORK

GraybaR — Everything Electrical — GraybaR ELECTRIC COMPANY



Precision machining is the reason why electrical men are turning to "Gorilla Grip" Mechanical Connectors.

Each terminal unit of every connector, lug or tap is machined to an exact wire or cable dimension. Only one size wire will fit each unit. There are no loose or hot connections with "Gorilla Grips." The terminal units are machined to fit many types of bodies but at the wire entrance, where it is important that you have a good contact, only one wire size will fit.

National Electric
PRODUCTS CORPORATION
300 FULTON BUILDING, PITTSBURGH, PA.

lower part of the casting has a flange for watershed and breather to avoid creation of a vacuum due to sudden cooling of the luminaire by rain. Moistureproof felt gaskets form a weatherproof and bug-proof seal between the hood and the reflector. Units with side mounting plates are gasketed with graphitized asbestos.

Power for War Production

(*Continued from page 11*)

with people, delegate responsibility, and get production answers should be put in their places.

While on the general subject of government personnel, it is not amiss to deal further here for a moment with one particular group, namely the actual operating personnel of numerous governmentally-financed electric generating systems. In the present emergency these men are power operators just as much as the engineers or supervisors of the private electric companies. They share the responsibility for getting out power for war production and with mighty few exceptions they are carrying out that duty earnestly. They have been especially valuable, as to the big federal hydro projects, in affording a quickly available source of electricity for various new metallurgical and chemical plants which devour huge chunks of electric energy, but which are additions to basic industries which heretofore have always preferred to make their own power rather than buy from the electric companies.

It is noteworthy also that such uses for such government power were advocated years ago by power company executives of broad vision, whose views were then ignored by government agencies eager to find quicker markets for that power, in favor of the more destructive policy of confiscating, or absorbing competitively, or buying under duress, the more easily visible customers, loads, and diversified retail markets of the already developed power company systems.

Had the policy then urged by experienced utility men, and now being belatedly followed, been put into effect five years ago in the Southeast, the only notable power curtailment heretofore temporarily required, even in a local region, would definitely have been unnecessary.

But in the present war emergency the better established federal systems and municipal plants, staffed by men with increasing practical operating experience, have buckled down earnestly to their task, have interconnected with neighboring companies, and generally have started a war record of constructive dimensions and aspect.

However, it should never be forgotten that the aggregate output of all of the federally-financed systems still amounts today to only a small fraction of the available energy supply in this country. There is no need for any utility company man to minimize the part the federal projects are playing in the war effort. But there is even less occasion for government officers to minimize the part played by the country's long-established, business - managed electric systems. It is pertinent, therefore, in approaching the end of The Utility's Responsibility in War-time to say a few words about such latter systems.

Those systems cover most of the country. They are widely interconnected with each other and are used to working together. They put out most of the electric energy. In the main industrial areas they supply practically all the purchased industrial electric service. They have nearly all of the backbone grid transmission lines and low voltage distribution lines over which America's basic manufacturing industries now get, and must get, their vital electric power supply for war production.

Engineers Discuss War-Time Problems

(*Continued from page 28*)

where the load has not yet developed, or has been greatly reduced by system rearrangements, and the transfer of the larger wire to locations where the load is increasing rapidly; building new sections of line which will shorten feeds to increasing loads rather than replace or add wire to existing routes; and removal of wire which is not required to maintain service except in case of the failure of some other source of supply.

Mr. Cole added these words of caution for following the above suggestions: "Since most of these expedients will release more material than they will require, it is hoped that some method will be

found to make it possible either to secure blanket approval of their use or to set up some very informal means of securing approval of individual projects. Otherwise, the volume of paper work and the delays entailed in securing approval may be so great as to seriously discourage any attempt to adopt them. This is particularly true in the case of overhead lines work where individual projects are small and their number very large. The volume of paper work necessary for specific approvals could easily become so great as to seriously interfere with more important projects."

The matter of "Power Supply to Distribution Systems in Wartime" was discussed at the AIEE meeting by H. P. St. Clair, of the American Gas and Electric Service Corporation. He told of how his company depends upon portable car-mounted transformers in emergencies.

As compared with distribution-station transformers, he said, "the transformers used in transmission substations are usually fairly large and more or less 'tailored' to fit a particular job. For both of these reasons, there results the possibility of a serious bottle-neck to the supply of power in case of (1) a serious transformer failure, or (2) a sudden demand for increased power, either at an existing location or at a new location for which it may not be possible to obtain new transformers within the available time. To take care of such emergencies, primarily on transmission substations, there have been designed and constructed for the system with which the author is associated, portable emergency transformers permanently mounted on specially designed railroad cars and arranged with a considerable number of voltage, tap, and phasing combinations to cover practically all of the transmission substation requirements on the system.

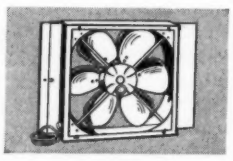
"The capacity of these transformers was made as large as railroad clearances and other limitations would permit, and the entire equipment includes lightning arresters and all necessary auxiliaries mounted on the cars. With the exception that lightning arresters must be dismantled during transportation, the entire transformer is carried complete with bushings and oil in place, ready

3 SURE WAYS TO MAKE EXTRA PROFITS THIS SUMMER

Here are three profit opportunities that can't miss—R & M *large-capacity* fans! They will help you replace part of your lost major-appliance volume.

Last year, working at top speed, we couldn't supply the demand for these fans. And this summer our stocks are limited by material shortages and war production—yet everyone predicts a *much greater* demand!

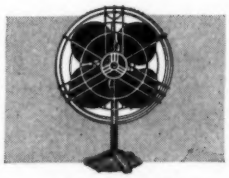
These R & M fans will sell—and sell *fast!* But getting them so you *can* sell them will depend on how quickly you let your distributor know how many you'll want. Get in touch with him *immediately* and give him your order for delivery as soon as possible. If you don't know the name of your distributor, write us or the nearest R & M Branch Office listed below.



R & M PORTABLE HOME COOLERS

Give the apartment, small home, store or office first-rate ventilation at very reasonable cost. Placed in a window and plugged into a nearby outlet, they exhaust hot indoor air and draw in cool outdoor air through other windows.

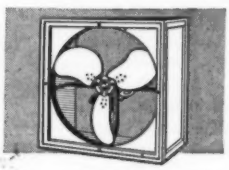
DETAILS AND PRICES: Model illustrated is also available with legs—delivers 3850 cubic feet of breeze per minute. Other models, for window-frame mounting, deliver 4000 and 7500 cubic feet. List prices range from $69.20 to $87.35.



R & M AIR CIRCULATORS

Widely used wherever powerful air circulation is required—in shops, homes and offices—the year round as well as during hot weather. Motor mounting permits fan to be tilted at any desired angle for maximum effect.

DETAILS AND PRICES: Model illustrated is for bench use. Other styles made for floor, wall and ceiling mounting. Made in two sizes; oscillating and stationary types. Deliver 7500 and 9500 cubic feet. List prices, $62.10 to $106.90.



R & M ATTIC FANS

Very popular in homes where complete changes of air are desirable. Fan alone, without housing, is suitable for wall mounting in restaurants, stores, and offices where extremely quiet operation is essential.

DETAILS AND PRICES: Four sizes, delivering from 5500 to 15,000 cubic feet. Prices range from $86.00 for 30″ size as illustrated, to $262.00 for 48″ size complete with suction box, automatic shutters and ceiling grills.

ROBBINS & MYERS · INC.

SPRINGFIELD, OHIO • Branch Offices in:

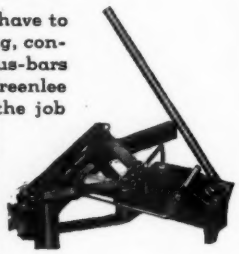
NEW YORK, 200 Varick St. CHICAGO, 2400 W. Madison St. PHILADELPHIA, 401 N. Broad St.
KANSAS CITY, 2105 Grand Ave. NEW ORLEANS, 500 Camp St. DALLAS, 1100 Cadiz St.
SAN FRANCISCO, 237 Rialto Building
THE ROBBINS & MYERS CO. OF CANADA, LTD., Brantford, Ont.

GET *Extra* MAN POWER with GREENLEE BENDERS

- EASIER AND FASTER
- ONLY ONE MAN TO OPERATE
- LIGHT, PORTABLE, EASY TO SET UP
- POWER TO BEND 1¼" TO 4½" PIPE
- SAVE COST OF MANUFACTURED BENDS
- MAKE SMOOTH, EVEN BENDS

As good man power becomes scarcer in the present emergency, increase the efficiency of your men by turning to a better use of tools. Let Greenlee Benders help you speed up construction by making the work easier and faster for the man on the job. Greenlee Benders are daily saving contractors on defense jobs from 15 to 75% in time and labor costs.

There's a Greenlee Bender For Every Job



Whatever you have to bend . . . tubing, conduit, pipe or bus-bars . . . there is a Greenlee Bender to do the job easier and faster. Small hand benders will bend copper tubing from ⅜ to 1⅛ inches and steel, copper, brass, and aluminum tubing from ¼ to ¾ inches. Powerful Greenlee Hydraulic Benders are available for bending 1¼ to 2-inch thin-wall conduit, 1¼ to 4½-inch rigid conduit and pipe, and for bus-bar up to 4 inches wide and ¾ inches thick.

These benders are all readily portable, easy for one man to operate, make smooth, even bends without distortion, and eliminate the need for many costly fittings and manufactured bends. Find out how Greenlee Benders can save vital hours on your defense jobs . . . write for Bender Booklet S-116.

Greenlee TOOL CO.

1765 Columbia Avenue, Rockford, Illinois

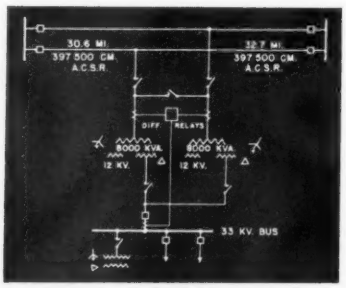
to operate as soon as it reaches its destination."

Mr. St. Clair said that "economies made possible by occasionally tapping transmission lines with relatively inexpensive step-down transformation have been so great that more and more installations have been made. Experiences with these installations and the development of methods of installing and protecting such equipment, as well as the transmission lines themselves, have brought this practice to the point where it is now considered a very practical and successful means of providing service at many suitable locations."

The speaker pointed out that elaborate protective equipment—although not the expense of high-tension circuit breakers—is justified for stations and loads of more than 150 kva. The accompanying figure shows "a typical medium-capacity station with automatic air-break switch protection for the high side, and with a differential relay scheme for clearing the transformers in case of trouble. The two main functions of the protective equipment in this case are as follows:

"1. For a transmission line fault, the transformer is disconnected by means of its low-tension circuit breaker from the sub-transmission system, which would otherwise feed into the transmission line fault through the transformer. To provide positive relaying of the transformer switch in case of line-to-ground fault on the transmission line, it is necessary that the transformer be wye-connected on the high side with the neutral grounded.

"2. For a fault in the transformer itself, the transmission line is opened by its own relaying and the transformer disconnected from the low-tension side by its own differential relays. Immediately thereafter during an interval of approximately one minute while the transmission line remains de-energized, the transformer high-voltage, air-break switch is opened up automatically from the operation of the differential relays. Following this, the transmission line is restored to service.



Medium - capacity 3 - phase transformers tapped to transmission line with automatic air-break switches.

"The desirability of providing a grounded wye-connection on the high side of such a transformer may add slightly to the cost of installation—either by necessitating a delta-winding on the transformer if it results in a wye-wye connection, or by requiring the installation of a grounding transformer for the low-tension bus if it results in a wye-delta connection and it is also desired to establish a neutral ground at that point for the low-tension system. This additional cost, however, is usually considered well justified to obtain the more complete relay protection which it affords."

* * * *

"Blackout of Street Lighting" was featured as a subject on the program of the Engineering and Operating Section of the Southeastern Electric Exchange at its meeting in Raleigh, N. C., March 12. George A. Eddy, of G-E's Lighting Division at Schenectady, N. Y., discussed the timely topic.

"The simplest, least expensive, and most quickly provided means for blackout of street lighting," he said, "involves the cooperation of the local air-raid wardens. It consists of the installation of an inexpensive weatherproof key-operated switch where necessary to effect control, and operation by the air-raid warden with a key provided for the purpose. Admittedly, the method has its drawbacks; it involves the services of a great many people who are not utility employees and whose actions may be somewhat unpredictable. On the other hand, there is now experience to show that the method is apparently successful for the long haul, once the lighting systems are provided with simple positive means for control, and the wardens are adequately instructed."

Because it requires much less wire than the typical series-circuit, remote-control pilot system, Mr. Eddy suggests the cascade system of series-circuit operation

BLACK-OUT RELAYS

Relays to black-out signs, bulletins, window lights, or open any other electrical circuit automatically. On a momentary or accidental interruption in the power line the relay opens a circuit and remains locked in the open position until reset manually.

AIR-RAID SIREN CONTROLS

Timing devices for the operation of sirens or signals to sound "Alert," "Air-Raid" or "All-Clear" signals. Designed to meet any specification or schedule of coded signals desired.

BLACK-OUT EMERGENCY LIGHTING SYSTEMS

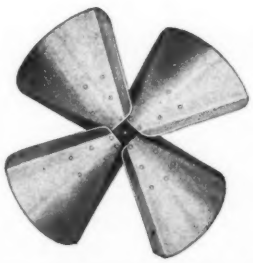
Provide automatic lighting of DC or blackout bulbs from a source of 6, 12, or 32 volts DC on intentional or accidental interruption of normal AC power lines.

Write for Information

AUTOMATIC
Electric Manufacturing Co.
MANKATO • MINNESOTA

The FRESH-AIR MAKER

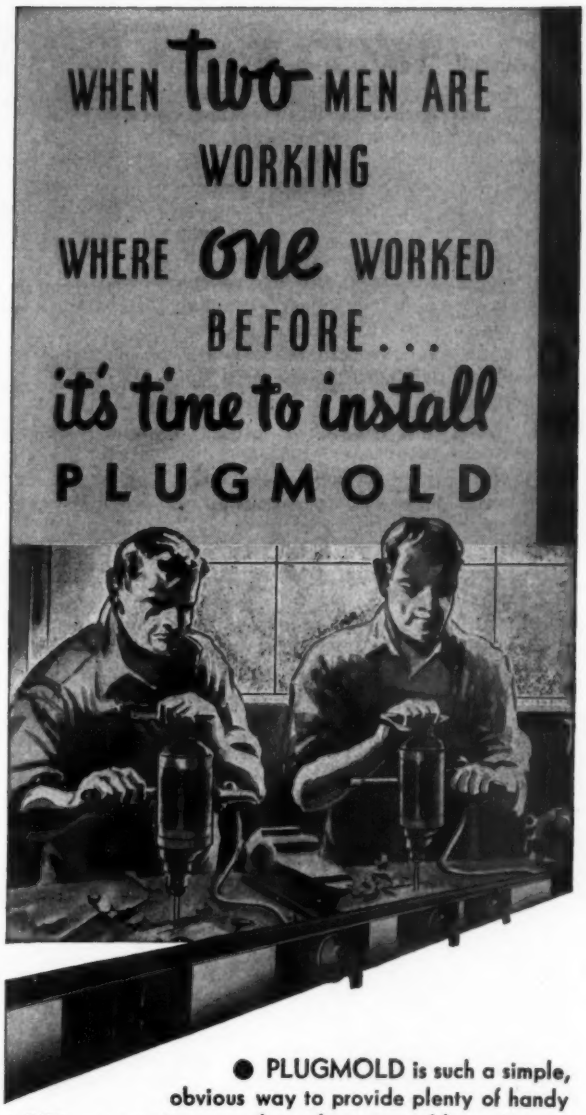
● Designed to give you a fast selling fan of high quality construction and fine appearance—Fresh-Air Makers are beautifully balanced, quiet and efficient in operation yet competitively priced—30″, 36″, 42″, 48″ diameters.



Or you can simplify your job if you build your own fans by the purchase of a proven, standard fan blade—individually packed—carefully balanced—three or four bladed type in 30″, 36″, 42″, 48″ diameters.

Write for further details and prices.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
125 FAN STREET INDIANAPOLIS, U. S. A.



● PLUGMOLD is such a simple, obvious way to provide plenty of handy convenience outlets along assembly or inspection benches . . in your engineering department . . . around laboratory tables . . . and in your offices . . . that plant men who have once seen its advantages wonder why they never thought of it before. Certainly this is a TIME-saver, STEP-saver and WORK speeder that will pay for itself many times over in busy defense industries.

Let us send further information.

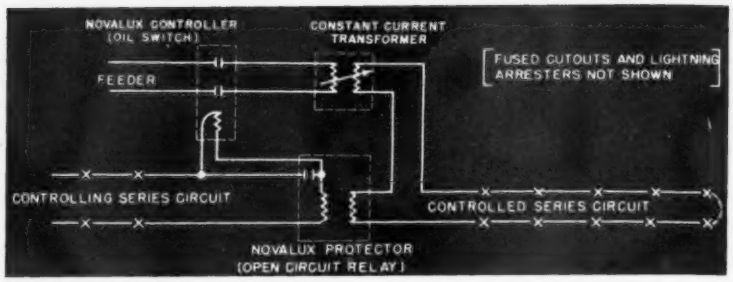
THE WIREMOLD COMPANY, HARTFORD, CONN.

PLUGMOLD
PLUG-IN-ANYWHERE WIRING SYSTEMS
by WIREMOLD

MORE OUTLETS for MORE OUTPUT

for blackout purposes. The accompanying figure is an elementary diagram of such a method of control. You will observe that the operating coil of the oil switch for the constant current transformer is of a type suitable for direct insertion in the controlling series circuit. You will observe also that the protector, or open-circuit relay, has a normally-open contact shunted across the oil-switch coil, for the obvious reason that the oil-switch coil will have to be shorted out in event of trouble on the controlled series circuit in order to de-energize the constant-current transformer.

"This method of control has the obvious advantage that no additional control wiring is necessary —or at least only so much as is required to reach from a controllable series circuit to the pole where the transformer for the next circuit is located. The principal disadvantage is that the failure of any one series circuit will shut down all series circuits cascaded from it, and for this reason there has been the general tendency to avoid this type of control under peacetime conditions. However, the method has been used successfully and appears to be entirely practical where the line construction is such that there are normally very few series circuit outages."



Schematic diagram of cascade control of a series street light circuit, with oil switch coil connected directly into controlling circuit.

H. A. Enos, of the American Gas and Electric Service Corporation, summarized the papers that had been presented at the AIEE convention, in his talk on distribution systems at the SEE operating meeting.

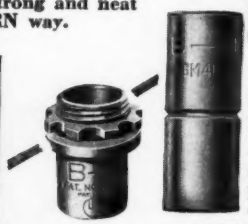
"The rapid increase in generating capacity and transformer capacity in substations," he asserted, "may bring about a serious problem in connection with the interrupting capacity of circuit breakers. In order to increase the interrupting capacity without replacement with higher-rated breakers, there are three possible alternatives. The first involves rebuilding or modernizing of the old low-capacity breakers. This cannot always be done economically, but where it can be it usually offers the best solution. The second alternative is to split the bus into two or more sections, and it may be necessary to tie the bus sections together by reactors if the system is so designed as to make it impossible to operate with independent bus sections. A third alternative is to transfer breakers from point to point, removing those larger than necessary, and replacing with smaller breakers from other locations. A further alternative is to take advantage of selective relaying to trip existing large-capacity breakers ahead of the inadequate breakers.

"With increased loads, other equipment, such as air-break switches and disconnect switches, may become thermally overloaded, but increased capacity may often be obtained by improving the contacts on such switches. Increasing contact pressure, silver-plating of contacts, and polishing of contacts may give sufficient improvement in current-carrying capacity to take care of the situation.

"In building new substations, it is possible to save considerable equipment by simplifying the substation layout; in this way reducing the amount of bus material, breakers, disconnect switches, etc. Such simplification should be based on providing only facilities which are absolutely necessary and omitting those which are actually non essential."

And there's just as much difference between the *streamlined* BRIEGEL METHOD of making conduit connections and old-fashioned methods.

The BRIEGEL METHOD saves you up to 50% on time and a substantial saving on materials allowing you a larger margin of profit on each job. Make quick, easy, strong and neat connections this MODERN way.



No extra turns or twists, no nuts to tighten when you use B-M connectors and couplings. Just TWO SQUEEZES with the patented B-M indenter (which costs you only $1.25) and you have a smooth efficient job. Approved by Underwriters Laboratories.

DISTRIBUTED BY

The M. B. Austin Co.
Chicago, Ill.
Clayton Mark & Co.
Evanston, Ill.
Clifton Conduit Co.
Jersey City, N. J.
General Electric Co.
Bridgeport, Conn.
The Steelduct Co.
Youngstown, Ohio
Enameled Metals
Pittsburgh, Pa.
National Enameling & Mfg. Co.
Pittsburgh, Pa.
Triangle Conduit & Cable Co.
Elmhurst, N. Y. C.

BRIEGEL METHOD TOOL CO., Galva, Ill.

FIBERGLAS

GIVES YOU THESE

4 ADVANTAGES

FOR THOSE *REALLY*

"HOT JOBS"

- High Heat Resistance
- Extreme MOISTURE Resistance
- Resists Corrosive Vapors
- Great Mechanical STRENGTH

Engineers are securing these advantages with the correct combination of Fiberglas and impregnants.

Fiberglas is carried in all standard forms — tape, sleeving, tying cord, and cloth. Also in such combinations as varnished Fiberglas cloth, mica and Fiberglas, Fiberglas laminated bakelite. For complete details and prices see pages 17 and 18 of the IWI Blue Catalog. Write today.

IWI

Distributed by:

INSULATION and WIRES, Incorporated

2127 Pine Street, St. Louis, Missouri
289 Simpson Street, N. W., Atlanta, Georgia

C. B. ROGERS

ELECTRICAL HEATING ENGINEER
CHROMALOX
ELECTRICAL HEATING UNITS
and
CHROMALOX
EQUIPPED PRODUCTS

1000 PEACHTREE STREET
ATLANTA, GEORGIA

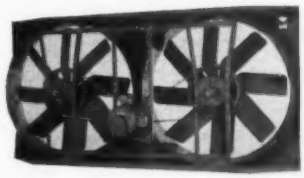
KEEP YOUR VIEWPOINT FRESH!

Every year is a "New Era".
Constant change—something new—something better—is a characteristic of America.
The easiest way to keep up to date in the electrical trade is through the pages of your business magazine. ELECTRICAL SOUTH gives you each month information, ideas, plans and suggestions based on the intimate contact of our editorial staff with the most successful electrical merchandisers over the South.
If you are not already a subscriber, send in your $1.00 today for a yearly subscription or $2.00 for three years. Extra postage on subscriptions to Canada, 50c per year; Foreign, $1.00 per year.

ELECTRICAL SOUTH
GRANT BUILDING
ATLANTA, GEORGIA

WARTIME SALES SLUMP?

not if you're selling



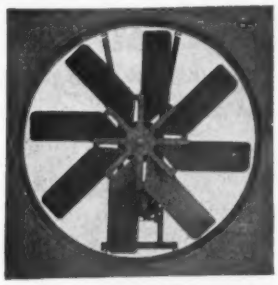
Coolair FANS

TRADE MARK

If wartime restrictions on materials and manufactured items are trimming your sales to the vanishing point—take on Coolair Fans and keep your sales and profits up!

Perhaps you haven't realized that every war production plant, factory, office and wartime housing project from coast to coast is a Coolair prospect . . . and that most civil necessity services, businesses and operations such as laundries, bakeries, hotels, hospitals, theatres, trade schools, recreation halls and restaurants, have priority ratings and are ready prospects for Coolair Breeze-Conditioning.

Because Coolair ventilating and cooling is a recognized necessity for speeding war production and promoting civilian health, you can broaden your operations and increase your profits by getting into this great and growing field where sales are easy to make.



COOLAIR Twin-Unit FAN
(illustrated above)
Widely used where limited headroom or vertical wall space does not permit use of adequate sized single unit Coolair Fan.

GENERAL PURPOSE FAN
Units with small motors are equipped with sound absorbing springs. Heavier units with larger motors for commercial and industrial application.

MAIL COUPON TODAY!

Please rush me the new Coolair Industrial Bulletin and complete dealership information.

Name_____

Address_____

City_____ State_____

Coolair Ventilating and Cooling Systems

AMERICAN COOLAIR CORPORATION
Manufacturers . . . . JACKSONVILLE, FLORIDA

IDEAL Wire-Nuts

Solderless, Tapeless Wire Connectors

SAVE CRITICAL MATERIALS

Conserve vitally needed Lead, Tin and Rubber. Use "Wire-Nuts"; they do not require these critical materials (as used in Solder-and-Tape Joints).

SPEED WIRING JOBS — Use IDEAL "Wire-Nuts" and other wiring devices to finish jobs before promised date.

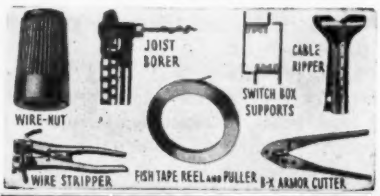
SAVE INJURY HAZARDS — No flame-spouting torch, hot soldering iron or molten solder needed for applying "Wire-Nuts."

FULLY APPROVED. Listed by Underwriters' Laboratories, Inc. Sizes for every job. MILLIONS IN USE!

WRITE FOR FREE SAMPLES, TODAY

EASILY APPLIED: — A Strip—A Twist — That's All! Better Electrically; Stronger Mechanically.

Other IDEAL Wiring Time-Savers

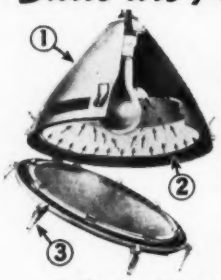


IDEAL SOLD THROUGH JOBBERS

IDEAL COMMUTATOR DRESSER COMPANY
1017 Park Avenue Sycamore, Illinois
"SALES OFFICES IN ALL PRINCIPAL CITIES"

Revere STANDARD DOME REFLECTOR

for use where Explosive Dusts are Prevalent!



NEW DUST-TIGHT COOL OPERATING

1. Housing shaped to shed dust.
2. Air circulates to dissipate heat.
3. Positive eccentric locking clips.

Defense 180° Fresnel Lens Floodlight for boundary lighting, etc.

Rotating 750 to 1500 Watt Enclosed-high efficiency floodlight of unique design for large area floodlighting.

Another Revere Achievement . . . a floodlight that provides utmost efficiency and safety. It is cool operating — temperature inside does not exceed 78°. A logical answer to a definite lighting problem.

Learn about the many Revere developments for Productive and Protective Lighting.

WRITE FOR PARTICULARS

REVERE ELECTRIC MFG. CO.
2512 NORTH PAULINA STREET, CHICAGO
Originators of the Hinged Floodlight Pole
INDOOR and OUTDOOR LIGHTING EQUIPMENT of EVERY DESCRIPTION

Oklahoma Utility Executives Meet

(*Continued from page 25*)

tives not to hesitate to ask deferment for any employees absolutely essential to their operations connected with national defense.

In his address, W. L. Woodward, Zenith Gas System, Inc., Alva, president of the association, predicted that tire rationing and other limitations on travel would result in many public utility executives and employees seeking help and inspiration in meetings nearer their homes.

Many group and individual freedoms have been unduly restricted by law but in spite of this public utilities are buckling down 24 hours per day to help win the war, E. H. Poe, American Gas Association, New York, declared in an address on "Public Utilities on the Battle Front of Democracy."

An appeal for return to free private enterprise was made by Erle P. Halliburton, Halliburton Oil Well Cementing Co., Duncan, Okla. "When the government appropriates money to build electric lines to compete with private utilities many do not realize that it is sapping the very basis of free enterprise. Many of these government projects would never have been built had they been required to show earnings on the investments," Mr. Halliburton said.

Two panel discussions were conducted. One was led by Frank J. Meyer, Oklahoma Gas and Electric Co., Oklahoma City, discussing general operating matters. The other, led by Oakah L. Jones, Oklahoma Natural Gas Co., Tulsa, discussed acounting, financial and tax matters. Mr. Meyer was elected chairman of the Electric Light and Power division, and R. W. Ducker, Tulsa, Oklahoma Natural Gas Co., was elected chairman of the Gas division.

Training Program For Service Men

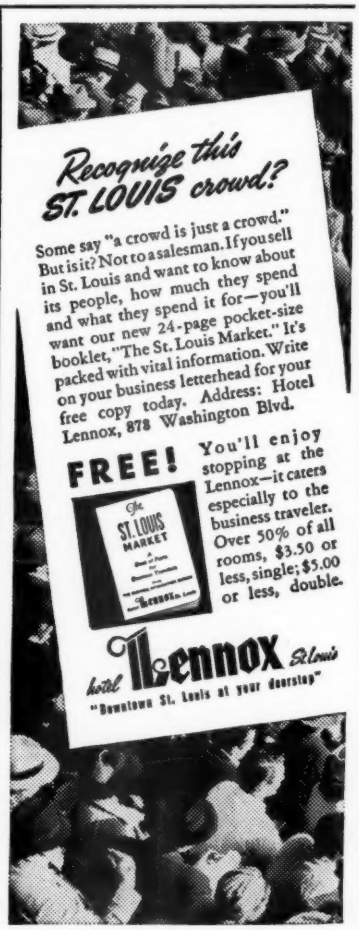
(*Continued from page 14*)

tributing $3 per week and the remainder being paid by the dealer on the basis of 35 cents per hour; for the second eight weeks, the salary will be $17.50 per week, the Electric Institute contributing $1.50 per week, and $16 being paid by the dealer on the basis of 40 cents per hour; for the third eight weeks, the earnings will total $18 per week, all of it being paid by the dealer on the basis of 45 cents per hour.

After the first eight weeks, the apprentice becomes more valuable and does more actual work for the dealer. Hence, it is felt that the dealer should contribute proportionately as the apprentice's knowledge grows and his worth increases. At the end of the 24-week period, it is pointed out by the Electric Institute, the dealer should pay his new serviceman not less than $25 a week, and more if he is worth it.

In addition, the student, by attending the Electric Institute meetings and completing his course, will receive several dollars in prize awards and about $110 worth of tools and equipment.

It is emphasized by the Electric Institute that the dealer's only cost of participating in this program will be the additional Electric Institute dues of $30 per man trained. Of course, this is matched by the Potomac Edison Power Company's dues in the usual ratio


Recognize this ST. LOUIS crowd?
Some say "a crowd is just a crowd." But is it? Not to a salesman. If you sell in St. Louis and want to know about its people, how much they spend and what they spend it for—you'll want our new 24-page pocket-size booklet, "The St. Louis Market." It's packed with vital information. Write on your business letterhead for your free copy today. Address: Hotel Lennox, 878 Washington Blvd.
FREE!
You'll enjoy stopping at the Lennox—it caters especially to the business traveler. Over 50% of all rooms, $3.50 or less, single; $5.00 or less, double.
The ST. LOUIS MARKET
hotel Lennox St. Louis
"Downtown St. Louis at your doorstep"

Prevent Motor Burnouts

with this fast drying varnish

Many motor burnouts can be prevented if original varnish insulation is renewed periodically with a coat of finishing varnish.

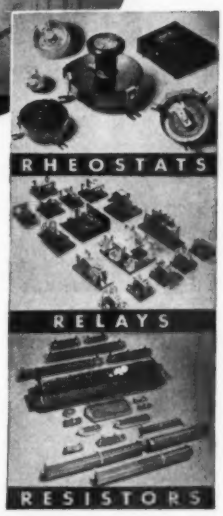
ELECTRIC LACQUER, a black, fast air drying insulating varnish is especially suited for this preventive maintenance work. One coat fills cracks and seals defects in old insulation. Its tough, glossy, black film presents a surface to which dirt and dust will not readily cling.

Check the outstanding advantages offered by ELECTRIC LACQUER.

1. Air dries in 30 minutes
2. Oil and waterproof
3. Acid resistant
4. High dielectric strength

FREE—Write for your copy of a new folder on the proper care of varnish insulation of electrical equipment.

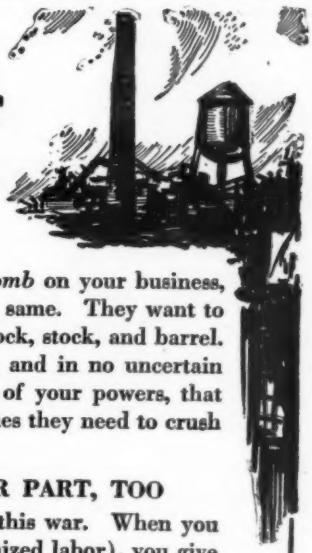
Dolphs **JOHN C. DOLPH COMPANY**
Insulating Varnish Specialists
166 EMMETT ST. NEWARK N. J.



CONTROLS FOR REFRIGERATION

Refrigeration aboard the individual vessels of the fleets enables a diet of fresh meat and vegetables at all times. Yes, our Navy eats well. Furnishing relays and motor controls for this marine refrigeration is but one of the important parts Ward Leonard is playing in providing essential electric controls for the Army, Navy and Air Corps.

WARD LEONARD
Electric control (WL) *devices since 1892.*
WARD LEONARD ELECTRIC COMPANY
37 SOUTH ST., MOUNT VERNON, NEW YORK



TARGET FOR TONIGHT
...*Your Business?*

Maybe they won't actually come and drop a *bomb* on your business, but the Axis war lords have their eye on it, just the same. They want to wipe it out as a competitive force—or take it over lock, stock, and barrel. Here is a threat that you can reply to *now*, today, and in no uncertain terms—by buying Defense Bonds to the very limit of your powers, that our armed forces may have the guns, tanks, and planes they need to crush the Axis *once and for all.*

HELP YOUR EMPLOYEES TO DO THEIR PART, TOO

Every American wants the chance to help win this war. When you install the Pay-Roll Savings Plan (approved by organized labor), you give your employees that chance. For details of the Plan, which provides for the systematic purchase of Defense Bonds by voluntary pay-roll allotments, write: Treasury Department, Section S, 709 12th St. NW., Washington, D. C.

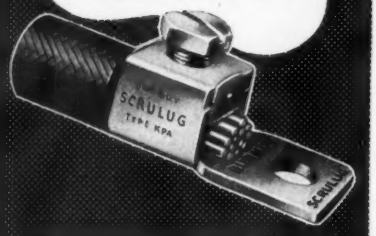
Make Every Pay Day **"BOND DAY"**

Save with **U. S. *Defense*** **BONDS ★ STAMPS**

This space is a contribution to Victory by

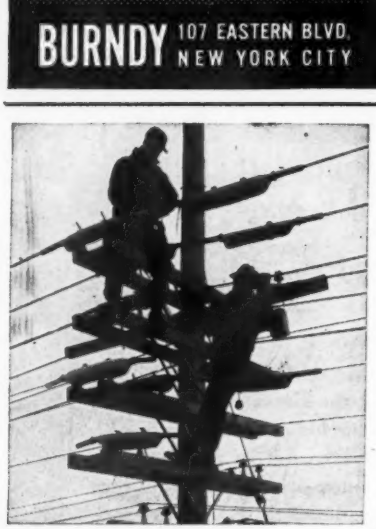
ELECTRICAL SOUTH

NO SPECIAL TOOLS
ARE NEEDED TO INSTALL
BURNDY
SCRULUGS



ATLANTA, GA.....W. R. Calverley
TAMPA, FLA.....Pat Baldwin, Inc.
SUMMERVILLE, S. C....J. P. Voight
NEW ORLEANS, LA....Electron Eng. Co., Inc.

BURNDY 107 EASTERN BLVD. NEW YORK CITY



Complete Protection in a Single Unit

It is paying many utilities to discard all damaged linemen shields and replace them with MARSHALL'S ONE PIECE LINEMEN'S SHIELDS. They cover both insulators on double cross arm repair jobs with but a single application.
During the quarter of a century that they have been on the market, there has never been a loss of life among its many users and over 1000 utilities have now standardized on MARSHALL'S.
A line to Linemen Protector Company, 1744 W. Alexandrine, Detroit, Mich., will bring prices and full information.

MARSHALL'S LINEMEN'S SHIELDS

of 1 to 3, which will support the entire Electric Institute program. The Potomac Edison Power Company is the electric power utility serving the District of Columbia territory.

It will be the Electric Institute's duty to contact the dealer and the student at least once a week in order to keep the apprentice contented with his job. If necessary, the Electric Institute will swap young men around to enable a satisfactory relationship to continue.

Later, according to the plans of the Electric Institute, a similar program with variations to meet the particular needs of the particular trade will be undertaken for other branches or phases of the appliance field.

As a starter in its sponsored program to aid the dealers in their servicing problems, radio servicing and repair will be launched. Then will follow a similar program with necessary variations in refrigeration servicing and repair, and then a similar program in washer servicing and repair.

The Electric Institute makes the point that refrigeration, washer and radio service is rapidly increasing to the point where many dealers will soon be swamped with work. With an added man or two, such as can be supplied through the programs to be undertaken under the sponsorship of The Electric Institute, a dealer will be able to handle a greater volume at a profit.

Through the servicing program sponsored by The Electric Institute, it is hoped to raise the standards of this phase of the business, and to make it more profitable by employing workers who will know how to charge for the work done. The educational phase of the programs is designed to call the attention of the general public to the fact that better results can be obtained from washers, refrigerators and radios and other appliances by having them serviced and repaired by qualified dealers, who carry identification to that effect.

Dallas Electric Club Serves Members Well

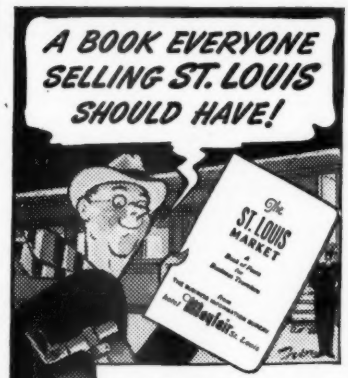
(Continued from page 15)

will continue to function much as in the past, affording the opportunity for relaxation available in the luncheon club, along with the opportunity for idea exchange offered when men having some common interest to bring them together regularly.

Officers of the Dallas Electric Club for the current year, include W. W. Lynch, president of the the club. Other officers are: first vice president, W. B. Clayton, commercial vice president of General Electric Company; second vice president, R. W. Rossler, Westinghouse Electric and Manufacturing Company; secretary, Walter C. Blair, of Texas Power and Light Company; and treasurer, M. F. Larmer, General Electric Company.

Members of the executive committee are W. G. Sterrett, of Westinghouse; George L. MacGregor, president of Dallas Power and Light Company, and past president of the club; B. R. Brown, Dallas Railway and Terminal Company; L. B. Merchant, Graybar Electric Company; E. B. Jennings, Southwestern Bell Telephone Company; and H. R. Worthington, General Electric Supply Corporation.

A BOOK EVERYONE SELLING ST. LOUIS SHOULD HAVE!



FREE...24 pages of essential market data

Never before, in one pocket-size book, so much up-to-date, helpful market data on St. Louis. Gives you actual comparisons between St. Louis and other principal markets with which you are familiar.

Twenty-four pages, packed with vital information on retail, wholesale and manufacturing businesses. A must for anyone selling St. Louis.

Write on your business letterhead for your free copy today. Address: Hotel Mayfair, 844 St. Charles St., St. Louis, Mo.

P.S. You'll really enjoy a stop at Hotel Mayfair. Nationally famous for friendly, efficient hospitality, good food and real comfort. And downtown St. Louis is right at your doorstep!

Over 50% of rooms, $3.50 or less, single; $5.00 or less, double.

hotel Mayfair St. Louis

Maintaining Good Will During the Emergency

(*Continued from page 23*)

twined that they are almost inseparable.

"Load-building programs are out for the duration, out for many well-known reasons. So, the best thing we can do—and the thing we MUST do—is to protect the loads now on the lines.

"There is no cut-and-dried formula for doing that. It is going to take ingenuity and imagination, common sense and hard work to do it. But it can be done. That is the number one thing for every electric company to do as the first step toward maintaining good will during the war emergency. Hold the load you now have! And keep it balanced insofar as you can. Residential, commercial and industrial.

"If we cannot replace old appliances with new ones, we can certainly see to it that the old ones are made to last as long as possible. And there is good reason for continuing to tell our customers the advantages of better light—better sight. In fact, there is more reason than ever to do this—for our eyes are in greater demand, they are more valuable, in this time of war.

"For one thing, we can teach our customers how to make their appliances last longer and serve better; how to make more efficient use of their electric service. We can do this through home service and customer service personnel, and we can do it through advertising.

Power Users Need Attention

"The industrial power users need close attention right now. Many of them are faced with the problem of converting to war production. The small plants and shops, particularly, are lost when it comes to this. They don't know how to go about getting contracts. We can and we should make it our business to help them. Our industrial power engineers, with their special knowledge, are in an excellent position to do this. In our own company they have been spending practically all of their time in this connection for many months.

"Our engineers have made comprehensive surveys of all the mills, plants and shops in our territory, showing the kind and quantities of tools, machinery and equipment available. I want to tell you about one direct result of this survey. In one small town there was an aluminumware manufacturer employing about 165 people. It was the sole industrial plant of any consequence there. When aluminum was no longer available for civilian goods, this plant had to shut down, throwing about 150 families out of a source of income. Through the efforts of our industrial power division, this plant obtained some war contracts. Today it is running full blast and employing even more persons than formerly.

"Unless these plants are converted to war production, many of them are going to close down and we are not only going to lose the good-will and friendship of these valued customers, but we are going to lose their revenue to boot.

"We have an opportunity of showing these customers, in many cases, how to make better use of their electric service; how to make equipment last longer and serve better: just as we have the opportunity of rendering similar service to our residential, commercial, and our rural customers.

"We must keep reminding, keep telling the public through personal contact and the printed word about ourselves and our services: we must keep telling people about the advantages of appliances, and how to keep them going to best advantage, even if we have none to sell. They'll be able to get them someday . . . and they will get them if the desire is there.

"Advertising has always been the most economical means of reaching the masses with messages. Too often, in times like these, advertising gets banged on the head. This is no time for that.

"We must keep customers informed about changes in policies that affect them. Failure to do so is one of the most dangerous things we can do. It is far harder to explain yourself out of a predicament than it is to prevent it. We need to tell the public what we are doing to help win the war. We need to tell customers about our services and facilities.

"In our own Company we have been using some newspaper advertising directed to various classifications of customers—residential, commercial, industrial, and rural—telling them of the services available that will enable them to make the most efficient use of their electric service and equipment. In these advertisements we have featured the various groups of employes who deal directly with these particular customers—home service representatives, commercial and industrial lighting engineers, industrial power engineers, and rural engineers. Sometime in the near future we intend to tell our customers about other classifications of employees . . . linemen, motormen, bookkeepers, and others . . . and what they do and how they help keep this business of ours going and geared to the war program.

Confidence Shared and Gained

"When you share confidence you gain confidence. So, when trouble arises, we need to put our cards on the table. We did it in our territory during the power shortage and the public worked with us. There is a marked difference between unwillingness and absolute inability to serve. Advertising can help explain the difference. There is something about seeing things in print that makes one believe them. Advertising is needed to back-up personal messages. So, I say—keep up your advertising to keep good-will.

"Summing up what I've said, these things will help maintain good-will during the war:

"1. Hold the load you have as long as you can.

"2. Prevent complacency within the company.

"3. Explain the difference between unwillingness and inability to serve.

"4. Preach and teach proper care and use of equipment.

"5. Help industrial customers convert to war work.

"6. Contact customers through special field staffs and your other employees.

"7. Remember the public is a "marching parade."

"8. Keep the public aware of your services and facilities.

"9. Keep the public sold on your services, through helping them to make it more helpful to them.

"10. When in trouble put your cards on the table and tell the public the facts.

"11. Devise and follow a well laid consistent plan that will make these things a real part of your business, not just a casual job for just some one to do."

ADVERTISER'S INDEX

The Advertisers' Index is published as a convenience, and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A

Adam Electric Co., Frank 2
Aluminum Co. of America ..... *
American Blower Corp. ..... *
American Coolair Corp. 61
Anaconda Wire & Cable Co. 6
Arrow-Hart & Hegemann Elec. Co. ..... *
Automatic Electric Mfg. Co. 59

B

Briegel Method Tool Co. 60
Bull Dog Electric Products Co. ..... *
Burndy Engineering Co., Inc. 64

C

Colt's Patent Fire Arms Mfg. Co. ..... *
Crescent Insulated Wire & Cable Co., Inc. 49

D

Day-Brite Lighting, Inc. ..... *
Dolph Co., John C. 63

E

Edison General Electric Appliance Co. 34

G

General Cable Corp. 33
General Electric Co. (Appliances) ..... *
General Electric Co. (Flamenol) 51
General Electric Co. (Lamps) 8
General Electric Co. (Wiring Materials) ..... Back Cover
Georgia Power Co. 53
Globe Lighting Fixture Mfg. Co. ..... *
Graybar Electric Co. 55
Greenlee Tool Company 58

H

Hazard Insulated Wire Works 1
Hotel Lennox 62
Hotel Mayfair 64
Hubbard & Company ..... *
Hunter Fan & Ventilating Co., Inc. ..... Front Cover
Hygrade Sylvania Corp. ..... *

I

Ideal Commutator Dresser Co. 62
Illinois Electric Porcelain Co. ..... *
Insulation & Wires, Inc. 61

J

Johns - Manville ..... *

K

Kearney Corp., James R. 5

L

Linemen Protector Co. 64
Lloyd Products Co. ..... *

N

National Electric Products Corp. ..... 3 and 56

O

Okonite Company 1

R

Railway & Industrial Engineering Co. 39
Revere Electric Mfg. Co. 62
Robbins & Myers, Inc. 57
Rogers, C. B. 61

S

Sangamo Electric Co. 43
Schwitzer-Cummins Co. 59
Silex Company ..... *
Square D Company ..... Inside Back Cover

T

Treasury Department 63

W

Ward Leonard Electric Co. 63
Westinghouse Elec. & Mfg. Co.
(Motor Controls) ..... Inside Front Cover
Wiegand Co., Edwin L. ..... *
Wiremold Company 59

Y

Youngstown Sheet & Tube Co. 4

__ *
__61
__ *
__ 5
__64
__ *
nd 56
__ 1
__39
__62
__57
__61
__43
__59
__ *
Cover
__63
__ 63
Cover
__ *
__59
__ 4
Y, 1942